Are you ready for SK190?

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# Introduction

***Human biology: A body in balance*** explores the diverse body systems, including, for example, the cardiorespiratory and nervous systems. You will look at the structure and function of these varying systems and more, and their interconnections. Before you begin the module, we would like you to contemplate very carefully whether you are ready to study this subject.

We anticipate that many of you will have studied the Open University stage 1 module, *SDK100: Science and health*. SK190 is a bridge between introductory OU stage 1 modules and higher-level study. It develops the core subject knowledge and study skills needed for higher education and distance learning within scientific and related disciplines. To enjoy SK190, however, there are some basic skills and concepts that you need to be sure of.

Please take the time to complete the 20 questions on the ‘Are you ready for SK190?’ resource. After concluding this quiz, you’ll have a better idea of how well prepared you are to start studying this module. Only you will have access to the results of the quiz. This means that your results will not be made available to your tutor, should you decide to go ahead and register for SK190.

This quiz covers four areas, you can do the activity in one go, or do part of it and return to it later. The questions will help you to reflect on your skill level across the following areas:

* Planning and time management, computer experience and study skills
* Essential English
* Essential maths
* Essential science

# Are you ready for SK190?

## Planning and time management

*Human biology: A body in balance* (SK190) runs for nine months, between October and the following June. You will need to allocate about 16–20 hours study time per week for this module.

In order to effectively navigate around your other commitments, e.g. paid employment, childcare, hobbies and holidays (don’t forget you need to eat and sleep!), a little time management will go a long way in making sure you create adequate study time. Where relevant, you could use audio recordings of your study to help you revise – on your commute to work, while you get your daily exercise, or while you attend to household chores!

Remember to also consider if you are committed to any other study. Studying another 60-credit OU module at the same time as SK190 (a total of 120 credits), for example, would require a total study time of 32–40 hours a week. We provide breaks in late December (2 weeks) and in March or April (1 week); however, throughout the rest of the nine-month period, you would be expected to keep up to date with your studies and submit assignments at regular intervals.

You should calculate how much time you have for SK190 study. Consider your other commitments in a typical week. For each day, record the amount of time that you are likely to be able to spend studying. Remember to also include some time off, as this is a schedule you will need to keep up with for nine months!

You can use the [Planning and time management calculator](https://learn1.open.ac.uk/mod/oucontent/view.php?id=32465) to help you.

Spending sufficient study time is likely to be the most important factor in assessing your own chances of success on this module. We know that some students will study at faster or slower rates than others, and we have prepared the module with this in mind. If you have no previous study experience, or have not studied recently, you may need to allocate the full 20 hours a week. If you have a science or health qualification already (for example, a recent GCSE or A Level, or have studied the Open University module SDK100 *Science and health*) you may find that you are able to cover some of the core content in a little less time.

You may also find it useful to work through the following activity:[At a crossroads: navigating work and/ or family alongside study - OpenLearn - Open University](https://www.open.edu/openlearn/crossroads)

## Using a computer

SK190 is delivered online via a module website (adjustments are available for students with disabilities). You will need a computer with reliable internet access in order to be able to study the module materials and complete your assignments. You will also be offered online tutorials and you will be able to communicate with your tutor and fellow students in our online forums. You will therefore find studying SK190 most straightforward if you are the sole or main user of a computer with internet access.

### Questions

1. Are you comfortable performing the following essential actions on your computer?

Tick all the options that you are comfortable with.

* Using the mouse and keyboard (or alternative tools designed to replicate these functions) to navigate around the screen.
* Using a word-processing program to create, edit and save documents.
* Creating, naming and organising files and folders so that you can find documents again.
* Using web-browsing software to find and navigate around websites.
* Using email.

1. Are you comfortable performing the following *useful* actions on your computer?

Tick all the options that you are comfortable with.

* Opening a link in a browser in a new tab or window?
* Managing bookmarks or favourite locations on your computer?
* Zipping files?
* Downloading and uploading files?

### Feedback

* If you ticked all the options, your overall rating for *Using a computer* is Green.
* If you ticked five or more of the options, your overall rating for *Using a computer* is Amber.
* If you ticked fewer than five of the options, your overall rating for *Using a computer* is Red.

As SK190 is delivered online, it is important that you feel confident using some essential computing skills. Whatever your score here, you may find it useful to work through the Using a computer for study module on OpenLearn before SK190 begins. Although the Open University provides a wealth of guidance material on computing issues, including access to a 24-hour helpdesk for registered students, learning to use your computer for these simple tasks is not part of the SK190 module and is therefore not covered by the 16–20 hours a week study allowance.

## Study skills: Active study

Active reading is an approach that can help you to better understand the subject you are studying. Within SK190 you will find in-text questions, activities and quizzes to help you to actively engage with the study material.

### Question

Indicate which of the following additional study techniques can be useful to make your study active (tick as many as you feel apply).

1. Use digital tools to underline/highlight key words and phrases as you read.
2. Make notes manually (in a notebook or an online document) to summarise points, raise questions, challenge what you’ve read, jot down examples and so on.
3. Test yourself by reading for half an hour, putting the text away and jotting down the key points from memory. Go back to the text to fill in gaps.
4. Look for 'signposts' that help you understand the text – phrases like 'most importantly', 'in contrast', 'on the other hand'.
5. Record yourself reading the module material or your notes and listen to the recording while you're travelling or doing household chores.
6. Skim through the material once and move straight onto the next study topic.

### Feedback

* If you ticked options a, b, c, d and e, your overall rating for *Study skills* is Green.
* If you ticked option f, or you missed any of the others, your overall rating for *Study skills* is Amber.

SK190 will help you to develop your study skills; but you should be aware that very few people can learn a subject just by passive reading. To get the most from your study time, you should try to ensure you adopt an active approach.

## Essential English

### Question 1

The correct order of words in a sentence is essential to convey the right meaning. If words are not in the correct order, ambiguities may arise. In the same way, correct use of punctuation is important. Whilst SK190 will help you to develop your communication skills, we anticipate that you are a ‘competent user of the English language’. This means that your English is at (or above) the level needed to get a GCSE grade A–C.

When a sentence is ambiguous, it has more than one meaning. For example, “I saw someone climb up the side of a building with a telescope.”

Did you use a telescope to see someone climbing up the side of the building, did you see someone climbing the building holding a telescope, or did the building have a telescope on the top of it?

The two sentences below are both ambiguous. Identify how many possible meanings there are for each sentence from the list below.

1. I saw bats.
2. The acid burned my hand which was odourless and colourless.

### Answer

Part (a) has four possible meanings:

1. I observed the mammals called bats.
2. I observed the sports equipment called bats.
3. I use a saw to cut the sports equipment called bats.
4. I use a saw to cut the mammals called bats.

Part (b) has two possible meanings:

1. The hand was odourless and colourless.
2. The acid was odourless and colourless.

### Question 2

There is one grammatical or spelling error in each of the following sentences.

Identify and correct each mistake.

1. Their are assignments to complete during your study of SK190.
2. We can’t decide weather to order pizza or curry for supper.
3. The cup of tea is to hot.
4. The human body is fasinating to study.
5. Writing in your own words is important in order to avoid accidentally plagiariasing material.

### Answer

1. **There** are assignments to complete during your study of SK190.
2. We can’t decide **whether** to order pizza or curry for supper.
3. The cup of tea is **too** hot.
4. The human body is **fascinating** to study.
5. Writing in your own words is important in order to avoid accidentally **plagiarising** material.

### Question 3

In SK190, you will build on the knowledge and skills developed in OU stage 1 modules, such as SDK100. You will be introduced to a range of biological molecules and consider human variation and diversity. You will also consider how our genetic information and our environment might interact. Read the following passage, which explains some concepts associated with genetics and then answer the questions at the end. This question enables you to assess your ability to extract information from a sample of text. All of the answers can be found within this piece of text.

The human body consists of billions of cells! Almost all the cells in an individual contain the same genetic material, packed into specialised structures called chromosomes. Each chromosome comprises a single molecule of DNA. DNA has three key properties: it is stable, its structure is easily duplicated, and it carries a store of information that is used within the cell to produce a type of biological molecule called protein.

In SK190 we will explore the structure of this genetic material. The DNA molecule is a double helix, each of the two strands of the helix are comprised of a string of nucleotides; each nucleotide is comprised of a phosphate group, a sugar molecule, and a base. If you imagine the helical structure of the DNA molecule straightened out, it would resemble a ladder, with the sides of the ladder made by the sugars and phosphates joined together, and with the rungs of the ladder formed by the bases on each strand, joining together. There are strict ‘base pairing rules’ which govern which bases can join with another, to form these ‘rungs.’

Using information from the text, decide whether each of these statements is true or false.

1. Each chromosome is made of many molecules of DNA.
2. The store of information in DNA is used to produce carbohydrates.
3. The DNA molecule is a single stranded structure.
4. The ‘rungs’ (i.e. bases) of the DNA helix pair in a random manner.
5. Each nucleotide is comprised of a phosphate group, a sugar molecule, and a base.

### Answer

1. False
2. False
3. False
4. False
5. True

### Feedback

There were a total of 12 possible marks in *Essential English.*

* If you got 9 or more out of 12, your overall rating for *Essential English* is Green.
* If you got 7 or more out of 12, your overall rating for *Essential English* is Amber.
* If you got less than 7 out of 12, your overall rating for *Essential English* is Red.

## Essential maths

SK190 is not a maths course; however, maths is used within health sciences, for example, to help understand some of the processes that occur within the human body, or to look at the differences between populations of people or cells.

Before you start the quiz, decide for yourself:

1. On a scale of one to 10, how confident do you feel with numbers?
2. What word do you feel best describes how you feel about maths?

Interested / happy / worried / confident / anxious / comfortable / excited / nervous

### Question 1

In SK190 you will explore aspects of nutrition and digestion. To answer this question, imagine that someone eats a lunch consisting of a cheese salad baguette. The wrapper indicates that this baguette contains a total of 10 g of protein. Imagine the person also eats a packet of crisps, which contains 2 g of protein per packet, and a banana which contains 1 g of protein.

How much protein did the person consume in total, in that meal?

### Answer

13 g

### Question 2

Imagine you work in an industry allied to health care. A quarter of the people in your workplace are trained in first aid. There are 40 people in your workplace.

From this information, how many people are first-aid trained?

### Answer

10 people are first-aid trained.

### Question 3

Imagine your calculator has just given you the answer to a calculation as: 5.8616.

The decimal number 5.8616 is expressed to four decimal places (there are four numbers after the decimal point). If 5.8616 is rounded to three decimal places, it becomes 5.862, because the fourth digit after the decimal place (6) is ‘5 or more’ – so the third digit is rounded up from 1 to 2. If the fourth digit had been less than 5, the third digit would not have been rounded up.

Follow the ‘5 or more’ rule to round 5.8616 to:

1. Two decimal places
2. One decimal place
3. Nearest whole number

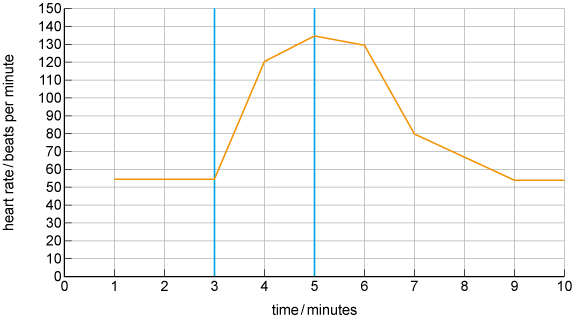
### Answer

1. 5.86
2. 5.9
3. 6

### Question 4

In SK190 you will learn about the heart and lungs, and other associated structures. Among other things, you will learn how the heart beats.

As part of an experiment looking at heart rate, the SK190 module team collected some data showing how an athletes heart rate changed immediately before, during, and immediately after a period of exercise. They then plotted this information on a graph, as shown in Figure 1.



**Figure 1** Heart rate data collected during an SK190 experiment. The first blue bar (minute 3) indicates the start of exercise, the second blue bar (minute 5) indicates when the exercise stopped.

Using Figure 1, answer the following questions:

1. The resting heart rate before the period of exercise can be identified on the graph. What was the resting heart rate?
2. The maximum heart rate was seen during the period of exercise. What was the maximum heart rate?
3. The exercise stopped at minute 5 on the graph. How long did it take for the heart rate to return to resting values?

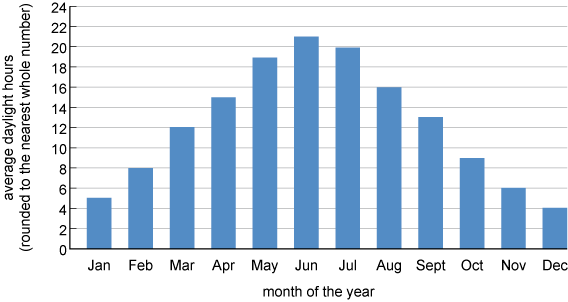
### Answer

1. 55 beats per minute
2. 135 beats per minute
3. 4 minutes

### Question 5

In SK190 you will study sleep. You will learn about the factors which may affect sleep, including exposure to daylight. Low levels of daylight trigger the release of a hormone called melatonin. Melatonin is naturally secreted in response to darkness.

The bar chart below shows the average daylight hours in Reykjavik, which is the capital city of Iceland. Most of the land mass of Iceland lies just below the Arctic Circle.



**Figure 2** Average daylight hours in Reykjavik, Iceland.

Using the information in the bar chart, answer the following questions.

1. In which month is melatonin likely to be secreted in the lowest amounts?
2. In which month is melatonin likely to be secreted in the highest amounts?
3. State the average daylight hours in December in Reykjavik.

### Answer

1. June
2. December
3. 4

### Question 6

As you will learn in SK190 sleep consists of distinct stages. Table 1 shows the duration of the deep sleep stage for three individuals, who were taking part in a sleep study.

**Table 1** Duration of deep sleep stages in a sleep study.

|  |  |
| --- | --- |
| Anonymised participants | Deep sleep duration / minutes |
| Participant X | 17.6 |
| Participant Y | 22.5 |
| Participant Z | 5.3 |

1. How many more minutes of deep sleep did Participant X have, compared to Participant Z?
2. Use the data in this table to calculate the mean duration of deep sleep, based on these three individuals.

### Answer

1. 12.3 minutes
2. 15.1 minutes

### Question 7

Working with very large or very small numbers can be tricky. Scientists often use powers of 10 notation (often called scientific notation) to make it easier to work with such numbers.

For example:

The distance from the Earth to the Sun is about 150 000 000 km or 1.5 × 108 km.

A human egg cell is 0.0001 m in diameter or 1.0 × 10−4 m.

A positive power of ten denotes how many times a number is multiplied by 10 (i.e. the number written in full is a very large number). A negative power of ten denotes how many times a number is divided by 10 (i.e. the number written in full is a very small number).

1. Red blood cells transport oxygen around the body. The size of a red blood cell is about 0.000008 m. Express this number in scientific notation.
2. The number of hair on a human head varies, but for our purposes here we’ll assume there are 150 000. Express this number in scientific notation.

### Answer

1. 8.0 × 10-6
2. 1.5 × 105

### Feedback

There were a total of 15 possible marks in *Essential Maths.*

* If you got all 15 marks, your overall rating for *Essential Maths* is Green.
* If you got 9 or more out of 15, your overall rating for *Essential Maths* is Amber.
* If you got less than 9 out of 15, your overall rating for *Essential Maths* is Red.

Working with numbers and maths can be challenging for many people. You may wish to spend 12 hours working through the [Basic science: understanding numbers](https://www.open.edu/openlearn/science-maths-technology/basic-science-understanding-numbers/content-section-overview?active-tab=description-tab) module on OpenLearn (or equivalent maths tuition) before SK190 begins. We will provide links to revision material covering all these maths topics, within the module, as well as online tutorials, but note that revising maths at this ‘essential’ level will fall outside the recommended 16–20 study hours per week. Refreshing your skills now, before the module starts, will save you time later on.

## Essential science

### Question 1

The human body contains trillions of cells. In order to function, these cells require energy. Identify the process by which human body cells obtain energy.

* Mitosis
* Phagocytosis
* Cellular respiration

### Answer

Cellular respiration

### Question 2

Match the organelles with the descriptions.

Organelles: Nucleus, Mitochondrion, Cell membrane, Ribosome

1. Stores DNA, which contains the 'recipes’ for proteins.
2. Generates energy in the form of ATP for cells to use – also known as the powerhouse of the cell.
3. Involved in production of proteins in the cell.
4. Maintaining the structure of the cell and controlling the passage of substances into and out of the cell.

### Answer

1. Nucleus
2. Mitochondrion
3. Ribosome
4. Cell membrane

### Question 3

Decide whether each of the following statements is true or false.

1. Cells do not contain proteins.
2. Essential amino acids are those that must be present in every protein.
3. Peptide bonds in a protein are formed between the amino group of one amino acid and the amino group of another amino acid.
4. Haemoglobin is a type of enzyme.
5. Cholesterol is an essential component of human cell membranes.
6. Glucose is a type of protein.

### Answer

1. False
2. False
3. False
4. False
5. True
6. False

### Question 4

As you study SK190, you will work across different levels of structural organisation. Arrange the following terms in order, from smallest to largest.

* Molecule
* Organism
* Organ
* Macromolecule
* Body system
* Cell
* Atom
* Organelle
* Tissue

### Answer

From smallest to largest:

* Atom
* Molecule
* Macromolecule
* Organelle
* Cell
* Tissue
* Organ
* Body system
* Organism

### Question 5

In SK190, you will study the immune system and explore some of the disease-causing agents the human body may face. Decide whether each of the following statements is true or false.

1. Human cells have a nucleus, but bacterial cells do not.
2. Viruses are not formed from cells and can only reproduce inside a living cell.
3. Bacterial and animal cells are about the same size.
4. Ectoparasites live on the surface of the human body, whereas endoparasites live inside the human body.
5. The innate branch of the human immune system produces antibodies and can fight specific pathogens that the body has encountered previously.

### Answer

1. True
2. True
3. False
4. True
5. False

### Question 6

In SK190 you will learn about the importance of water in the human body. You will also learn some of the chemistry which explains why water is so important.

Water can be written as H2O.

1. How many atoms are in a single molecule of water?
2. How many oxygen atoms are in a single molecule of water?
3. How many hydrogen atoms are in a single molecule of water?

### Answer

1. 3
2. 1
3. 2

### Feedback

There were a total of 28 possible marks in *Essential Science.*

* If you got all 28 marks, your overall rating for *Essential Science* is Green.
* If you got 18 or more out of 29, your overall rating for *Essential Science* is Amber.
* If you got less than 18 out of 29, your overall rating for *Essential Science* is Red.

# What does your feedback mean?

**If you received all green ratings** for your quizzes, then you appear to have sufficient time, skills and basic knowledge to study SK190.

**If you received one or more ambers**, then you may need to reflect on your availability, or you may need to revise your skills in one or more areas before studying SK190. We would strongly advise you to undertake some preparation before SK190 begins – you can find some suggestions below.

**If you received one or more reds**, then perhaps you may require some additional groundwork to study SK190 at the present time. Or you may need to reconsider how to find more time for study. It is advisable to allocate at least 16–20 hours a week over a 9-month period in order to study SK190 successfully. If, by the time you begin this module, your preparation is inadequate, it could mean you having to invest even more study time each week in order to progress through the module.

If you are based in the UK, you are strongly advised to regard an Open University Access module to gain experience and study skills before you begin SK190 – more details about Access modules can be found below. In our experience, if you proceed with SK190 after having taken an Access module first, you are more likely to be successful.

# Preparing for SK190 study

SK190 does not assume any previous science qualifications. However, in order to study the module successfully you need to be sufficiently prepared. If you received reds or ambers in the Are you ready for SK190? quiz, you are likely to need to spend around 16–20 hours on some preparation. Once you have done further preparation for SK190, you are advised to return to try the Are you ready for SK190? quiz to check your progress.

You may find it useful to look through: [Finding Time to Study | Open University](https://www.open.ac.uk/courses/do-it/finding-time)

## Language skills

To study SK190 you need to be able to read and write to a good standard in English. You can check your language skills on the English for OU study website which will also point you towards some online resources for developing language skills.

You may find it useful to look through: [English Language Skills | Open University](https://www.open.ac.uk/courses/do-it/english-skills)

## IT skills

To study SK190 you will need a computer and some basic computing skills such as writing a document using a word processor programme. You will learn all the other online study skills you will need while studying SK190. You can find some advice about acquiring a computer and studying online on the Skills for OU study website.

You may find it useful to look through: [Computing and IT Literacy Skills | Open University](https://www.open.ac.uk/courses/do-it/computing-skills)

## Maths skills

Most Open University science and health courses assume that you can add, subtract, multiply and divide whole numbers. In SK190, the additional basic maths skills you will use include: handling decimal numbers and percentages, and working with tables and graphs to study health concepts and information. You may find the following resources useful for brushing up your maths skills:

* [Basic science: understanding maths](https://www.open.edu/openlearn/science-maths-technology/basic-science-understanding-numbers/content-section-overview?active-tab=description-tab)
* [The Open University Maths Help website](http://mathshelp.open.ac.uk/)
* The Open University SDK100 Maths workbook (PDF document) can be downloaded from [Are you ready for SK190?](https://learn1.open.ac.uk/course/view.php?id=100619)
* Once you are registered, and as soon as the SK190 website becomes available, you would also have access to the SK190 primer via the SK190 module website. This covers a wide range of maths for science, along with communication and data-handling skills.

# Studying an Open University Access module first

If you are studying in the UK, an OU Access module is the perfect starting point if you feel you need to develop your study skills, and build your confidence before starting SK190. For many students, Access modules remain ideal pathways to prepare for their qualification. It has also been observed that students who have taken an Access module in the past have gone on to be more successful in their future studies.

Go to the [online interactive quiz](https://www.open.ac.uk/courses/do-it/ready-for-success) to check whether an Access module is for you.

The most appropriate Access module to take as preparation for SK190 is the Science, technology and maths Access Module (Y033). You can find out more on the Access modules website. Select your own country from the drop-down menu near the top of the page.

The stage 1 module, SDK100 Science and health, is also excellent preparation to study SK190.

Alternatively (or if you are not studying in the UK), you may want to consider exploring one of our not-for-credit Science online short courses that can be studied online at any time. For example, Learn about human genetics and health issues, or Learn about molecules, medicines and drugs. Find out more on the [Science online short courses website](https://stem.open.ac.uk/Science-online-short-courses).

You may find it useful to look through: [Entry Requirements | Am I Ready? Tool | Open University](https://www.open.ac.uk/courses/do-it/ready-for-success)

# Got a question?

If you have any further questions about studying SK190 or other Open University modules, contact an adviser in our Student Registration and Enquiry Service. Email <mailto:ouw-customer-services@open.ac.uk> or call +44(0)300 303 5303.