



Causes of Human Disease: Exploring Cancer and Genetic Disease

Explore how the unravelling of genetic code has led to a deeper understanding of genetic diseases and cancer.

If your students are completing the whole of this course online and are not participating in the teacher-led lessons based on it, then they can complete useful and engaging activities based on the content covered. You can choose for your students to complete individual tasks by themselves or encourage group work. Though you may have your own ideas about what your students can do with the course content, we've made things easy for you by suggesting some activities that you can submit to your students below. Instructions for the students can be found later in this document.

Individual student tasks taken from the course

Reflection: Students write a 500 word reflection on what they learned from the course, including anything they might do differently now as a result of their learning, and anything additional they found out from their own reading around the topic. They will submit this reflection as a written essay, podcast or video.

Activity: Students produce an informative leaflet on the following carcinogens: UV light, hepatitis C virus, and alcohol (to be made available to patients in a hospital or a GPs office, for example). Students should include on their leaflet the mechanism by which each carcinogen causes cancer.

Research task: Students choose and research one example of a single gene disorder. They should present their findings to you on this disorder, including information on symptoms, statistics, and treatments.

Group tasks based on the course

Collaborative task: Allocate students to a group or allow them to choose who they want to work with. Ask them to create visual representations of DNA and DNA replication. Students should watch the video in Step 1.5 (on DNA replication), then create their images in their groups. Images must contain and represent as many different components of DNA as possible.

Research task: Allocate students to a group or allow them to choose who they want to work with. Each group researches and makes notes on DNA replication mistakes. Inform groups that their research must answer the question:

- Why is it important that mistakes sometimes occur in DNA? Consider the variation in lifeforms on this planet.

They submit their research findings to you alongside a summary of how they worked together as a team.

Additional support

You can use the [How to use FutureLearn guide](#) with your students to get them started. There is also a school-facing [Guide to safeguarding and security on FutureLearn](#) if you need it.

Test

You can use the test questions listed in the student instructions below as a short assessment to enable your students to demonstrate what they have learned on the course. The assessment has 15 marks in total.

The questions have been designed to be flexible and open. The questions indicate which steps the answers can be found on. The marks available reflect the likely length and complexity of the answer expected, and how many points they are likely to make. For example, a 5-mark question might reflect a longer, more complex question, or one where they have asked to describe or explain a number of elements. Depending on the level and ability of your students, you can decide how you wish to award the marks so they are appropriate for your class.

Each question suggests which steps the students may wish to return to answer the questions. **You can decide if you want to include this information when you share the assessment with your students.**

Student instructions

Reflection

Write a 500 word reflection of what you have learned from the course. It should include anything you might do differently now because of what you learned, and anything additional you found out in your reading around the topic. Submit this reflection to your teacher as a written essay, podcast or video.

Activity

Produce an informative leaflet on the following carcinogens: UV light, hepatitis C virus, and alcohol (to be made available to patients in a hospital or a GPs office, for example). You should include how each carcinogen causes cancer.

Research task

Choose and research one example of a single gene disorder. Present your findings on this disorder, including information on symptoms, statistics, and treatments.

Group collaborative task

In your group, create visual representations of DNA and DNA replication. Watch the video in Step 1.5 (on DNA replication), then create your images using any appropriate materials or software. Images must contain and represent as many different components of DNA as possible.

Group research task

In your group, research and make notes on DNA replication mistakes. Your research must answer the question:

- Why is it important that mistakes sometimes occur in DNA? Consider the variation in lifeforms on this planet.

Submit your group research findings to your teacher, alongside a summary of how you worked together as a team.

Test

Complete the assessment questions below to demonstrate your understanding of the course. You can refer back to the course to find the answers or more detail as you need to. You should not however share your answers with other students.

Your answers should be written in full sentences and be appropriately detailed. Make sure you read the questions carefully before starting to answer. Each question shows how many marks are available – use this to guide how much detail or how many points you need to include.

[The questions also indicate where you can start to look to find the answer. You can also include information from other steps if that is relevant.]

1. What are the elements that make up DNA? (4 marks) [Step 1.3]
2. What is the difference between mitosis and meiosis? (2 marks) [Step 1.5]
3. List two carcinogens, and give an example of the type of cancer they can cause. (4 marks) [Step 2.2]
4. Describe an example of a single-gene disease. What are some of its symptoms and treatments? (5 marks) [Step 2.10]