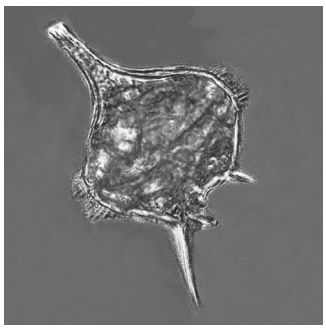
0 1 A biologist is researching a type of organism called a dinoflagellate.

Dinoflagellates are single-celled organisms that live in water.

Figure 1 shows a dinoflagellate.

Figure 1



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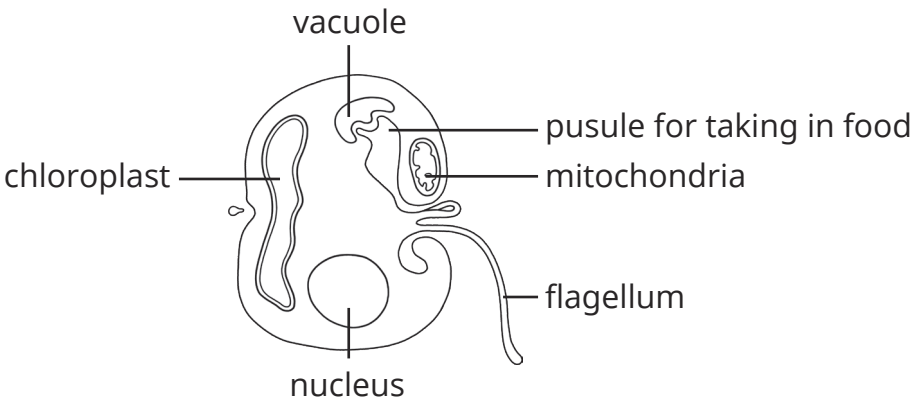
0 1 . 1 Explain how the biologist would use a microscope to observe a dinoflagellate.

[6 marks]

0 1 . 2 **Figure 2** shows a different type of cell.

Figure 2



Dinoflagellates are made of only single cells and live in water.

They have features of both plants and animals.

Give the function of the mitochondria.

[1 mark]

0 1 . 3 Give **one** piece of evidence that suggests the dinoflagellate is an animal cell and **not** a plant cell.

[1 mark]

0 1 . 4 Give **one** piece of evidence that suggests the dinoflagellate is a plant cell and **not** an animal cell.

[1 mark]

0 1 . 5 Describe how the location of the genetic material in the dinoflagellate is different to the location of the genetic material in a bacterial cell.

[2 marks]

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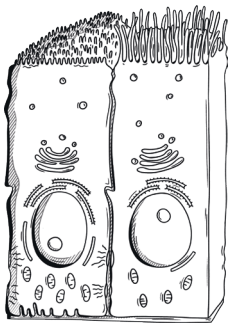
0 2 **Figure 3** shows some ciliated epithelial cells.

Figure 3



0 2 . 1 Explain why a ciliated epithelial cell has many mitochondria.

[2 marks]

0 2 . 2 Many ciliated epithelial cells line the upper part of the respiratory system.

Give the word that describes this group of cells.

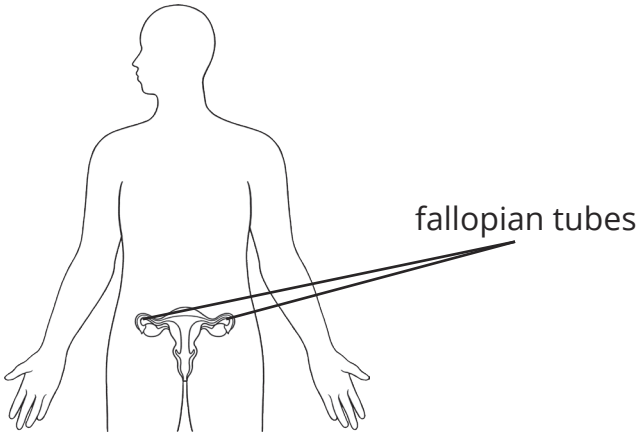
[1 mark]

0 2 . 3 Why can this word **not** be used to describe a group of sperm cells?

[1 mark]

0 2 . 4 Ciliated epithelial cells are also found in the fallopian tubes. **Figure 4** shows the location of the fallopian tubes.

Figure 4



Fallopian tubes carry egg cells from the ovaries, where they are made, to the uterus, where a baby will develop if an egg is fertilised.

Name the organ system in which the fallopian tubes are found.

[1 mark]

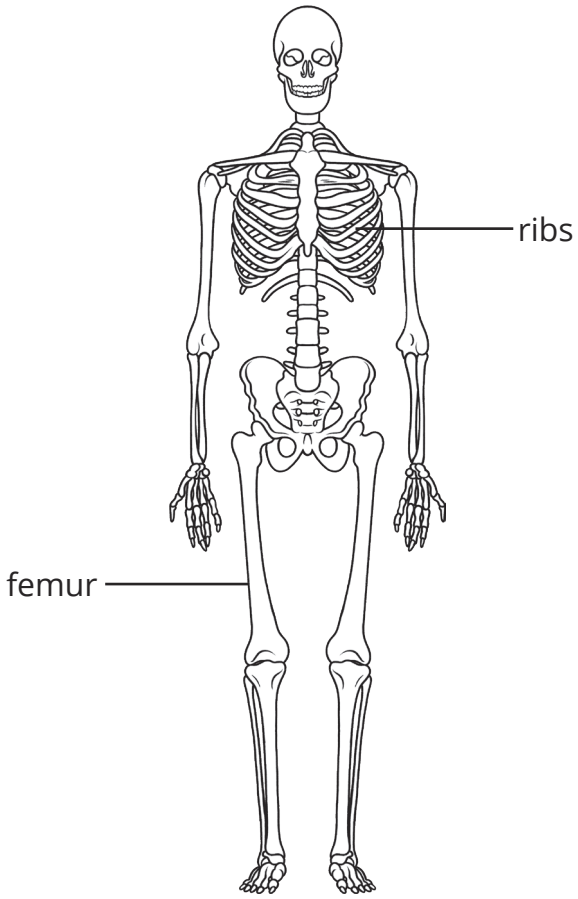
0 2 . 5 Suggest why ciliated epithelial cells line the fallopian tubes.

[1 mark]

6

0 3 **Figure 5** shows the skeleton.

Figure 5



The skeleton has multiple functions.

0 3 . 1 What is the function of the ribs?

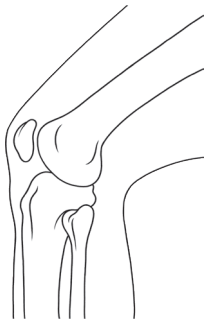
[1 mark]

0 3 . 2 What is the function of the femur?

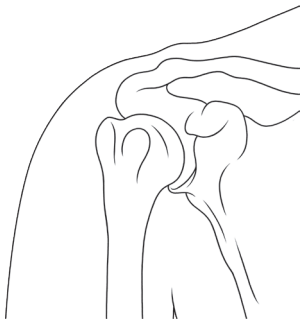
[1 mark]

0 3 . 3 **Figure 6** shows the knee joint and the shoulder joint.

Figure 6



knee joint



shoulder joint

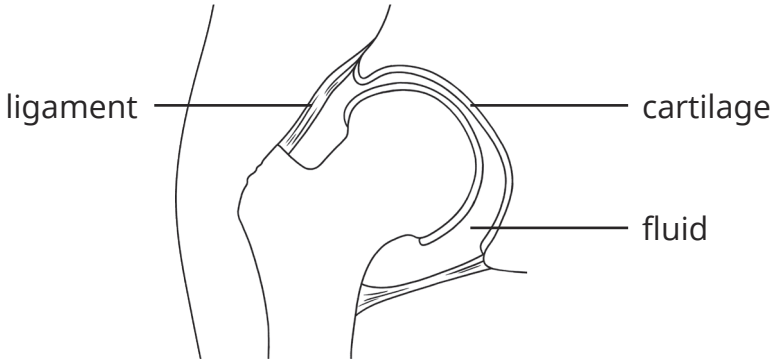
Describe the difference in movement between the two joints.

You should name the types of joint in your description.

[4 marks]

0 3 . 4 **Figure 7** shows a hip joint.

Figure 7



The hip can be affected by osteoarthritis, which results in the loss of cartilage and fluid in the joint.

Explain why people with osteoarthritis in the hip joint experience pain and a grinding sensation when they move the joint.

[3 marks]

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