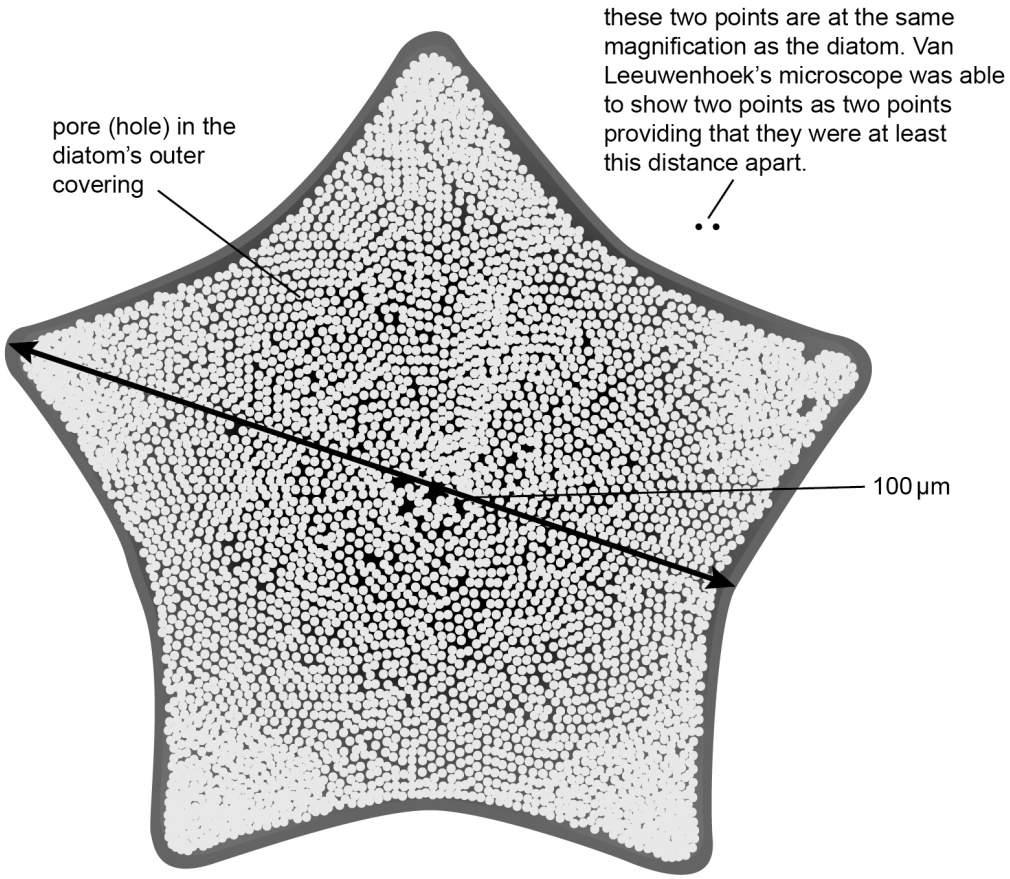
E1 Diatoms are algae, 20–120 μm in length and with 1 μm diameter 'pores' in their outer coats. Van Leeuwenhoek described diatom shapes but not their pores. Explain why.

1 The diagram shows an organism called a diatom.



a The width of the diatom is 100 μm (as shown by the arrow). On the microscope image above, this distance is 10 cm. What is the **magnification** of the image? Show your working.

b What is the name given to the minimum distance between two points that can still be seen as two points, when using a microscope?

c Look at the distance between the two spots in the upper right part of the diagram. How does the distance between these two spots compare with the diameter of one of the pores?

d Antonie van Leeuwenhoek examined diatoms using his microscope but he did not draw in the pores. Explain why not.

e The pores are about 1 μm in diameter. Give this value in millimetres, nanometres and picometres.

f To produce the image of the diatom at this magnification, a microscope with a ×20 eyepiece lens could be used. What magnification of objective lens would be needed? Show your working.

2 **a** Compare an electron microscope with a light microscope. Make sure you include at least one way in which they are similar and one way in which they are different.

b Explain why we can see some details inside cells with an electron microscope that we cannot see with a light microscope.