

Origins of the Universe

Outcomes: (NSW Stages 4 and 5 Science Syllabus)

5.16 gathering information from secondary sources

5.18 f) select and draw the appropriate type of graph or diagram to convey information and relationships clearly and accurately.

Lesson:

1. Access the information presented at http://pilbara.mq.edu.au/wiki/Main_Page.
2. Click on the link to Evidence.
3. Students are to read through the information presented on this page.
4. Students complete the activity.

Activity:

Microscopy and elemental analysis is an important tool for scientists. Use Virtual Lab: Virtual Microscope to complete this activity. Stromatolites provide useful evidence for the origins of life on Earth and possibly the universe.

1. View the light microscope sample of a stromatolite and describe (provide characteristics and features) the main features of this structure.
2. Use the ruler to approximate the area of this cross section of stromatolite. (Area (μm) = width x height)
3. Use links from http://pilbara.mq.edu.au/wiki/Main_Page to explain the term *stromatolite*.
4. View the scanning electron microscope sample of a stromatolite. Compare (how are they similar) and contrast (how are they different) the difference between this image and the light microscope image. Use a table to display your response.
5. View the X-Ray Electron Dispersion Spectrometer sample of a stromatolite at magnification x450. Choose a section of the stromatolite to analyse. In the section chosen for analysis visually estimate the percent of each of the elements and record the data below:

Element	Element Symbol	Estimated % in sample
Aluminium	Al	
Barium	Ba	
Iron	Fe	
Oxygen	O	
Silicon	Si	

6. Draw an appropriate graph to represent the data in the table above.
7. Use the ruler tool to estimate the area of the section of stromatolite chosen. (Area (μm) = width x height)
8. Use the information in the table from question 5 and the area calculated in question 7 to calculate the approximate area of each element in the section of the sample chosen. Record the data in the table below:

Element	Estimated area in sample (μm) (estimated % in sample x area)	Estimated area in sample (mm) ($\mu\text{m} \div 1000$)
Al		
Ba		
Fe		
O		
Si		

9. Draw an appropriate graph to represent the data in the table from question 8.
10. What do you notice about how these graphs compare to one another?