

Self-directed Learning in STEM Education



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Using microscopy to promote high level engagement and independent learning in STEM.

- I aimed to improve the delivery of microscopy, allowing students to develop competence at handling microscopes and to enjoy using them independently.
- Students used class microscopes, along with an SEM (scanning electron microscope) on loan from the Institute of Research In Schools (IRIS) for their investigations.

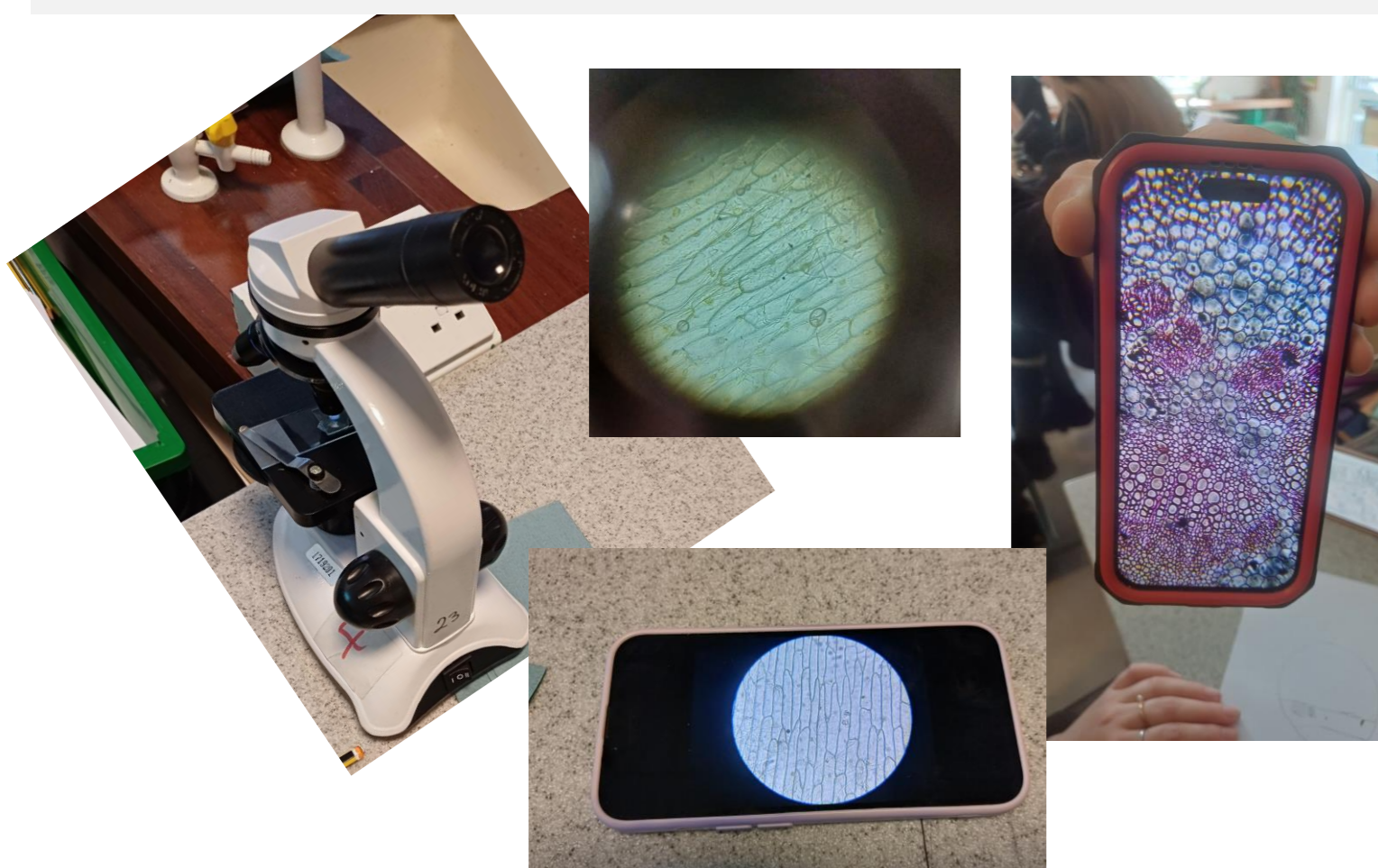
1. Sixth formers being introduced to the SEM in class.



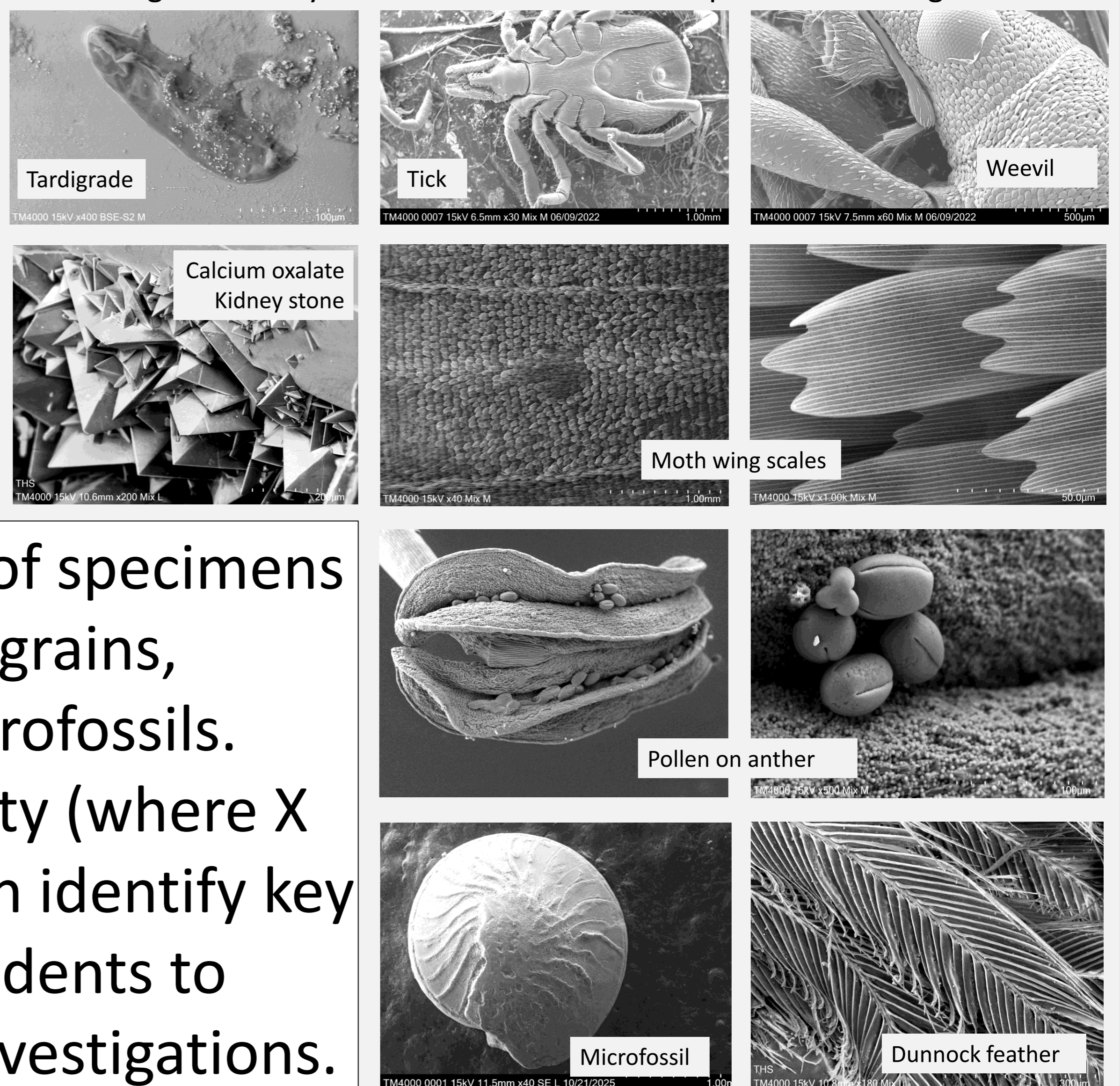
2. EDX chemical analysis of a kidney stone on the SEM.



3. Students used phones to improve access to images when using traditional classroom microscopes.



4. SEM images taken by students and used for independent investigations.



- Students investigated a range of specimens including a kidney stone, pollen grains, arthropods, tardigrades and microfossils.
- The SEM also had EDX capability (where X rays emitted from specimens can identify key chemical elements) enabling students to gather chemical data for their investigations.

Conclusion: This project inspired both students and teachers, encouraging curiosity and allowing the opportunity for independent discovery. It enabled students to plan their own scientific approach and gave them a sense of pride and ownership in their findings.