Touchdown on Mars: Up Close and Personal with the Red Planet

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The project

Aims:

- To introduce the idea that Earth can be used to understand other planets and vice versa
- To show that the lengthy word 'geomorphology' describes a deceptively straightforward study
- To excite the next generation about exploring Mars

The project is a game I run with local primary and secondary schools. First, I ask the class to tell me how features including volcanoes, rivers, sand dunes, and impact craters look from space. They are then given A3 images from the surface of Mars, and their task is to help me by identifying those same features on another planet. Three photographs of the same feature are given: true colour, colour-graded topography, and three-dimensional with 3D glasses. This explains how real geomorphologists work with different tools. Working together, the groups are given fifteen minutes to label their images and understand what features they contain, before presenting their findings to the class.

So far I have run this game with Years 4-12 and it has been tremendously successful: some students use count over two hundred craters in one image; others write scripts to present their findings; I was exceptionally impressed when one team identified glaciers, which I had thought too advanced to cover. At the end of the game I thank the class for teaching me more about the surface of Mars, then break down the meaning of "geomorphologist" to explain how they have all just become one in the last hour.

The value of the grant

I requested funds from the BSG to purchase two new items to really excite students during this course:

- **A Mars globe:** Previously I used a poster to contextualise the hand-out images once the game was over. Now, the globe of Mars I bought thanks to the BSG allows people to better undersyand the scale of Mars' features; it makes contextualising the locations of their hand-out images more vivid; and most importantly it helps them picture Mars as a planet just like Earth
- **A martian meteorite:** There is no more astonishing feeling than holding a piece of Mars in your hand. At the session's end I can now share that feeling with the audience by letting them handle – with gloves – a piece for themselves. I tell them how far that rock has travelled, how old it is, and how immeasurably unlikely it was that it ever reached Earth and their hands.

Both these items, but particularly the meteorite, have significantly enhanced my Mars geomorphology sessions by truly exciting the students. I like to hand out gloves so they can pass it amongst themselves and feel they are handling something extremely precious. It almost always sparks the same great questions – "How do we know it's a meteorite?", "How do we know it's from Mars?" – meaning the audience (often including parents and scientists) are thinking critically and are interested.

I cannot thank the BSG enough for these invaluable additions to my outreach work. I know I will use them over the rest of my academic career, and if anyone else would like to run the Mars geomorphology game themselves they have only to contact me.

Figure 1. The martian meteorite gets handed around at Stargazing Oxford 2018, a family-oriented day of space-themed stalls and activities at the University of Oxford.