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Using Science Fairs to Enhance Soil & Water Science Communication in Rural South African Elementary Schools

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Introduction

Science fairs are a great way to engage students in their own learning. This is especially crucial in low resource settings where students not only lack sufficient access to resources but may also face linguistic barriers.

The Eastern Cape Province of South Africa is a great case study to investigate the opportunities and challenges in elementary school education in a low resource setting. Fascinatingly, it is also a place of great natural beauty and scientific interest, which makes it ideal for use as a natural learning lab.

The goal of the Parks & People (South Africa) 2015 cohort was to use a science fair to enhance science communication across linguistic barriers in the low resource rural area of Hobeni (Eastern Cape Province). In Hobeni, an intimate relationship exists between the land and its people. This relationship was central to the science fair as it allowed us to combine science instruction and indigenous knowledge around topics of soil, water and Xhosa culture.



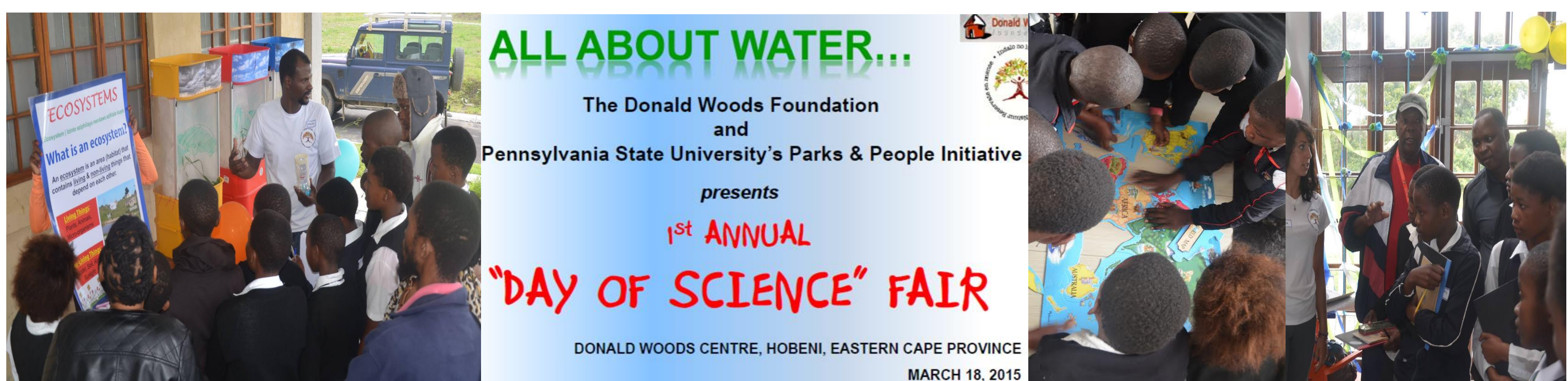
Learners

Over 35 students and teachers from 6th and 7th grade representing six (6) different elementary schools in Hobeni, Eastern Cape Province, South Africa.



Overall Approach

The design of the fair was based on elementary school science teaching methods that promote explanation-building. Students were divided into three (3) groups and engaged in several activities (three (3) main stations) during the morning portion of the fair. All activities were hands-on and centered around the interactions of soil and water and the role of these in the local Xhosa culture. During the afternoon portion, students used storytelling and bookmaking as tools to communicate the topics explored during the morning portion of the fair.



One of the Stations: SOILS - Soil as a Filter Activity

• Learning Performance

Students used prior or indigenous knowledge to construct explanations of soils as a filter. Students also used investigation to obtain evidence to support their argument of whether or not soils can be used as a filter.

• Big Questions

- ❖ Can soils filter out impurities from water?
- ❖ Do all soils work the same?

• Prior Knowledge (Indigenous Knowledge)

What is soil? What is soil used for?



• Obtaining Evidence (Materials & Methods)

Materials had to be readily available and relatively cheap. Materials used included soda bottles (cut in half); soil (sandy & top soil); purple food coloring; cheese cloth; rubber bands; plastic cups



• Discussion (So What?)

Students' Consensus: Soils can filter out impurities from water but not all soils do a good job filtering out the impurities. We know this because with the sandy soil, the purple water came out from the soil still looking purple but with the top soil, the purple water came out looking almost clear. All soils do not work the same. We have to take care of our soils because we depend on our soils everyday!



Future Direction

It is our intention to expand the science fair so that we can include other elementary schools and teachers from the Hobeni School District. We also plan to include the one high school in the area. Additionally, we will continue to develop appropriate assessment tools to evaluate how the science fair is enhancing the South African's natural and social science curriculum in these schools.

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