

Vignettes representing the experience of one Focal Youth each from 2019 and 2020 cohorts.

Cara (2019)

Twelve-year-old Cara has a moderate interest in science before participating and cares about the environment. She joined the activity because *“I think it’s important to learn about the natural world as it is such a big part of our lives. And because it is under such threat from humans.”* She enjoys science in school, and strongly agrees that she is able to help take care of nature and believes she can contribute to solutions to environmental problems through her actions. However, she understands the purpose of the BSS activity to be *“To teach a new generation about the world as it is under so much threat also to raise awareness,”* seemingly unaware of the research purpose that goes alongside this. During the activity she develops her expertise, learning some seaweed identification from memory by the end of the task, no longer relying on the ID guide. She shares her knowledge with others; *“Fran shouts out loudly from a few metres away “OMG I found pink paint!”* Cara corrects her, shouting back *“calcified crust!”* Cara takes on a stewardship role, asking others not to disturb the habitat. She participates fully in the survey activities, using the ID guide, following the transect protocol, observing seaweeds closely with a magnifier and filling out the recording form. After participating, Cara reports an increase in confidence in her ability to do science both in and out of school (agree to strongly agree). Despite her interest and confidence in science, and engaged participation in the task, missed opportunities for learning are evident from her interview. Questions that arose for her during her participation and her interest to explore beyond the boundaries of the survey activity were not taken up. In the interview discussion about the research purpose of the task, she wasn’t aware it was contributing to real science and had *“No idea”* what happened to the seaweed information she had collected. She had no awareness of the involvement of scientists, of scientific organizations or of what the data were being used for. After participating, she continues to view the purpose of the activity as being *“To learn about the different varieties of seaweed,”* not for scientific research. She successfully completed the project activities, but the real-world context, and opportunities to pursue her own interest within or around the project were missing and this may have shut down opportunities for learning.

David (2020)

Eleven-year-old David regularly talks to others about science outside of school and spends time outdoors almost every day. Like Cara, he strongly agrees that he is able to help take care of nature and believes he can contribute to solutions to environmental problems through his actions. He feels that he is pretty good at understanding science topics and feels confident in his ability to explain science topics to others. In the pre-participation survey, David reports the purpose of the activity as *“to monitor the effects of global warming on our seas”* demonstrating that the scientific framing and real-world context of the activity were communicated effectively from the outset, even by group leaders, before the BSS team delivered the introductory session. In a post-training session survey, David recalls that the framing video was about *“How important seaweed is to our planet, and how climate change is affecting our seaweed and this, in turn, is then affecting our marine life as a whole. The video also explains how to take part in the Big Seaweed Search, and introduces us to someone who contributed last year.”* While we don't have observational data of David participating on the beach, in a post-participation interview he reports doing the survey with his family and a friend, including his Grandad who has a good level of knowledge of seaweed identification. He recalls observing his parents setting out the transect, participating in searching for seaweeds and identifying them with his grandad, and his mum taking the photographs. He also uploaded the photos to the online system with his mum. Although he didn't physically take part in all the component tasks, he was aware of them all, in marked contrast to Cara who conducted the seaweed search part, but not the preparatory activities of gathering equipment and setting out the transect, or the follow-up activities of submitting the data to the research team. In the follow-up survey, David recalls many different species of seaweed using the scientific names, including species not included in the ID guide. Despite this scientific language, interestingly, he doesn't relate many of the tasks to “doing science.” When asked “Did it feel like doing science?” he responds *“No. It felt like we were having fun on the beach... I guess the only bit that felt scientific was measuring the plot, and afterwards uploading the data.”* He also says *“I felt like I was doing something... more like herbology.”* However, participating changed his view of what the field of science includes, saying, *“Well, from school we normally do experiments, seeing what happens if you preserve ice cubes in [inaudible], things like that. [...] Yes, it's kind of changed how I think different types of science, like different studies to do, like chemistry, like plants and nature and stuff.”*