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***Results of Peer Review***

**Certification Assessment for Curriculum-Based Program**

Product Number: 16113

**Results for this review:** **The certifiers determined that this submission demonstrates certification standards. The submission...**

* Demonstrates how to connect the group's educational objectives with the meanings and significance inherent in the resource
* Provides opportunities for audience members to form their own intellectual and emotional connections to the meanings/significance inherent in the resource through the cohesive development of a relevant idea or ideas

*Keep in mind that this is only a "point-in-time" assessment, and should not be construed as more than that. The standards for certification vary with each competency, and may take practice to understand and/or demonstrate consistently. The combined analysis of the reviewers is provided below.*

**The certifiers identified the following ways in which the submission meets the certification standards:**

**Identified Connection of Educational Objectives to Resource Meanings:**

The following educational objective: **Utah 6th Grade Core Science Benchmark Standard 5: Objective 1 (Students will observe and summarize information (size, shape, and structure) about microorganisms)** was connected to the following resource meanings and/or significance: **A collection of cyanobacteria, algae, lichens, mosses and liverworts form the "hidden life" of cryptobiotic crust.**

The following educational objective: **Utah 6th Grade Core Science Benchmark Standard 5: Objective 3 (Students will identify helpful uses of microorganisms and the role of science in the development of understanding that led to positive uses)** was connected to the following resource meanings and/or significance: **Cryptobiotic Crust plays an important role in the health of desert ecosystems and surrounding community through stabilization and nutrient enrichment of soils, recharging of springs, and creation of beautiful landscapes. Knowledge about how crust grows and how it is damaged can lead us to better land management decisions.**

**Identified Opportunities for Connections to Meanings:**

The program used **definition and magnified images** (interpretive techniques) to develop opportunities for **comprehension** (intellectual connections) and opportunities to feel **surprise** (emotional connections) in relation to the following resource and its meanings: **Although small and hidden, the microorganisms found in cryptobiotic crust are very much alive.**

The program used **anthropomorphism (move around soil and grow big and strong), word picture (sticky feet), photographs and explanation** (interpretive techniques) to develop opportunities for **discovery** (intellectual connections) and opportunities to feel **amazement** (emotional connections) in relation to the following resource and its meanings: **Cyanobacteria has developed amazing adaptations to stabilize soil which can only be seen and appreciated through magnification.**

The program used **a cartoon to show homes between sand grains, statistics (5 years to develop 1mm), and personal commentary** (interpretive techniques) to develop opportunities for **recognition** (intellectual connections) and opportunities to feel **concern or distress** (emotional connections) in relation to the following resource and its meanings: **Because horizontal compression brings death to cryptobiotic crust, footprints and ATV tracks on the landscape not only mar its beauty, but also make it less healthy.**

The program used **illustrations of erosion and examples of proper behavior** (interpretive techniques) to develop opportunities for **mindfulness** (intellectual connections) and opportunities to feel **pride** (emotional connections) in relation to the following resource and its meanings: **The protection of cryptobiotic crust in fragile desert ecosystems needs the help of responsible, educated people.**

**Identified The Cohesive Development of a Relevant Idea(s):**

The program presented the relevant idea that: **Cryptobiotic crust is a living part of the desert ecosystem that relies on the actions of individuals to keep it healthy.** This idea was cohesively developed in the following way: **By starting big (entire NPS) and then working smaller (focus on Utah parks, then Capitol Reef, then about specific places students had hiked in Capitol Reef), the program was able to bring larger picture protection issues down to a specific resource in the park. The general description of "black, crunchy dirt" led to an in-depth look at the microscopic components and scientific definition and name of cryptobiotic crust. From this microscopic level, the program then took a step back to look at all the benefits healthy crust brings to an area as well as the negative effects of its destruction. The program continued with a list of concrete examples of how individuals can help protect this ecosystem. At the end of this program, students were empowered to see themselves as part of a larger community needed to spread the word about the crusts' benefits and threats.**

**Suggestions or Additional Comments:**
*The certifiers may not be familiar with your park or the specific constraints of your program. Their suggestions are intended to offer ideas which may or may not be adaptable for your program. Please consider these coaching ideas with an open mind toward how your program might be strengthened.*

Opportunities for emotional connections to resource meanings
**The interpreter did a great job of connecting students emotionally to a technical topic. The magnified illustrations seemed to particularly inspire awe.**

Other suggestions or comments
**If time allows, it may be interesting to explore the reasons why some students preferred the desert dune photo to the Capitol Reef desert ecosystem photo. Acknowledging multiple perspectives related to the recreational and aesthetic value of Utah's desert ecosystem could offer additional opportunities for the students to contemplate their own thoughts and feelings about protecting parks as naturally healthy ecosystems.**