OVERVIEW

Module 3: **Exploring Extreme Life**

OVERVIEW	This module explores the extreme life forms that survive on the planet Earth, and why astrobiologists study these creatures to learn how life might survive on other worlds. Lesson 1 is optional and not needed for Lesson 2 or 3. Lesson 1 introduces extreme life with a slime creation activity. Lesson 2 explores extreme creatures through physical play. Lesson 3 focuses on the extreme life found in the Sonoran Desert.
LESSON 1: INTRODUCING EXTREME LIFE	Students are introduced to organisms that survive in extreme Earth environments. The teacher will read Bartholomew and the Oobleck, and then invite students to investigate "oobleck" - a mixture of corn starch and water that has interesting physical properties. They will then learn about one particular form of extreme life: snottites. **Duration: 60 minutes**
LESSON 2: ASTROBIOLOGISTS AND EXTREME LIFE	Students explore different types of extreme life that can survive heat, cold, high pressure, or low water. Next, they will play a "Red Light Green Light" inspired game, and/or a "Tag" inspired game, as they pretend to be one specific living thing. (You can choose to play one game, or both games.) **Duration: 40-60 minutes**
LESSON 3: FROM DESERT TO SPACE - CREATE A LIFEFORM!	Students will explore their existing knowledge of organisms that live in the Sonoran Desert. They will then apply what they've learned about extreme life to life in the desert. Students will utilize their knowledge of extreme life and the Sonoran Desert to design an extraterrestrial that could survive on a world with similar conditions. **Duration: 45-90 minutes**.
SUCCESS CRITERIA	• Students develop scientific reasoning and creativity in exploring extraterrestrial life. • Students are able to explain what "extreme life" is, and give several examples. • Students understand the role of extreme life in astrobiology.

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MATERIALS

- *Bartholomew and the Oobleck* (book or video of someone reading the book)
- Corn starch - 1.5 cups per group
- Water - 1 cup per group
- Spoons - 1 per group
- Bowls - 1 per group
- 1 measuring cup
- (Optional) food coloring
- Large space (such as gym or outdoor area) for playing the games.
- Air dry clay
- (Optional) badge clips for attaching cards to students
- (Optional) outdoor space with a natural desert environment

Found on AABC website:

- Extreme Life PowerPoint
- Extreme Life in the Desert PowerPoint
- 32 Extreme Life cards
- 4 Extreme Environment cards if playing "Red Light Green Light"
- 4 Tardigrade cards if playing "Tag"
- YouTube videos as indicated by the lesson plan
- (Optional) Worksheets for Lesson 3

This module was created by Marguerite Samples, an elementary school educator at Pueblo Elementary in Tucson, AZ, and Adria Avila Castro, an elementary school educator at Bloom Elementary in Tucson, AZ, in collaboration with the Arizona Astrobiology Center. It is supported and distributed by the University of Arizona's Astrobiology Center with funding from the Marshall Foundation, Tucson, AZ. For more information, contact Lauren James at laurenjames@arizona.edu. Lesson kits are available for checkout from the Arizona Astrobiology Center - https://astrobiology.arizona.edu/