Peggy Lemaux, Barbara Alonso
University of California, Berkeley

Part of the STEMware™ project, “Collaborative Research Strategies: STEMware™ – Designing Immersive Biology Learning Simulations for Formal and Informal Settings”. Lead PIs: David Gilchrist, Barbara Soots, UC Davis. Funded by National Science Foundation (Award Number #0929717)

This STEMware project was funded by the National Science Foundation to create a “serious cybergame”, termed “Zombie Plague”, where largely high school-aged players explore real-world, STEM technologies and careers in biology-related game scenarios.

Backyard Mystery (ByM) is a companion curriculum to Zombie Plague, focused on the same topic areas as that curriculum: diseases, pathogens and careers, but using interactive paper and physical games rather than cybergames. In contrast to Zombie Plague, ByM content is for middle school participants in afterschool settings, like 4-H and other similar venues. The curriculum attempts to engage student interest in genetics, genomics, biotechnology and the bioSTEM workforce.

Introduction to Curriculum

Curriculum Organization
The curriculum is designed in two formats to accommodate different afterschool learning situations: Combined ByM and Expanded ByM. The Combined lesson covers all major topics in the Expanded Lessons but in less detail. Paper-based games are offered in Section 2 of the Combined Lesson, while both paper and hands-on activities are offered in the Expanded Lessons.

Combined ByM
This version of the curriculum can be completed in one 1.5 hour session and is intended for 8 to 20 participants in grades 5-7. Section 1 introduces participants to four different types of disease-causing organisms through a matching game. Section 2, which features four different backyard panels: each panel is assigned to a group of participants. They are asked to identify a problem in their panel, i.e., wilting plants, sick animal, a friend who looks ill or a dying fish.

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Participants then engage in four paper-based activities relating to four different cool, scientific tools. These are tools that are used in modern diagnostics to help identify culprits causing disease problems. After completing the activity, participants earn puzzle pieces with a code that is used in Section 3 to identify the culprit causing the problem in the backyard. Also in Section 3 participants are introduced to careers related to lesson content.

Section Summaries

Section 1: Culprit’s Spell
Approximate completion time: 20-25 min
Introduces participants to four “culprits” or pathogens causing problems in the backyard, i.e., fungus, virus, parasite or bacterium.

Section 2: Cool Tools Solve Mysteries
Approximate completion time: 30-40 min
Engages participants in four activities aimed at getting puzzle pieces, which are used in Section 3 to determine the culprit (activity handouts shown below). Activities introduce participants to some of the modern tools used in hospitals, clinics and nurseries to identify pathogens.

Section 3:
Part 1: What’s the Culprit?
Part 2: Careers in Catching Culprits?
Approximate completion time: 15-20 min
Part 1 focuses on figuring out what culprit is causing the problem in the backyard. Part 2 reveals how participants can get involved in careers involving pathogen identification.

Expanded Lessons
If the leader has more time with the students and wants to engage them more deeply in these topics, each Section of the Combined Lesson is expanded into a stand-alone Expanded Lesson that can be completed sequentially in separate 1-hour sessions. The expanded lessons can also be used on their own as the content dictates.

Expanded Lesson 2 offers both paper-based and hands-on activities. By providing different activities, it allows for the leader to repeat parts of the Expanded Lesson to give participants more exposure to its content. Activities arorganized for 8 to 20 participants.

For more information, contact Barbara Alonso (balonso@berkeley.edu), phone 510-642-1589 or visit http://ucbiotech.org/backyardmystery