

Sharing ASSETs: Expanding Science Opportunities in K – 12 Classrooms



The ASSET Project

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What does ASSET do?

ASSET provides inquiry-based hands-on K-12 biology curricula specifically designed for elementary, middle, or high school students, including comprehensive teacher and student guides.

What makes ASSET different?

All ASSET lab activities feature safe, easy-to-use **LIVE** protists in an **ENGAGING** exploration of a variety of basic biological concepts.



An equipment lending library ensures that all schools can use ASSET materials.



Cross-curricula activities engaging students in a dynamic consideration of the inter-relatedness of science and society.



All activities classroom tested and evaluated for content and effectiveness!!

Who uses ASSET?

Elementary teachers and students.
Middle school teachers and students.
High School teachers and students.

Teachers from **32 states** have attended ASSET workshops and/or used ASSET kits!

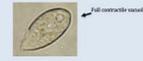
Examples of ASSET modules

Micro-evolution



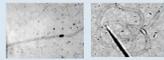
Watch live cells evolve in real time! Predator-driven real time evolution in a micro-environment in a week. Clear phenotypic changes in bacterial growth pattern and niche formation in liquid culture and changes in bacterial colony formation on agar plates.

Osmolarity



Osmotic effects made clear! Predict, test, observe, and analyze the effects of osmotic changes on cell size, shape, and activity while monitoring individual contractile vacuoles. Enhanced observation includes digital camera imaging.

Toxicology



Test cell responses to a variety of environmental challenges using digital cell tracking. Analyze effects of serial dilutions, dose responses and population effects. Formulate independent questions and design experiments to answer them.

Mutation



Explore effects of temperature and media variation on easily demonstrated mutations in living protozoa. Temperature sensitive mutants are normal at room temperature but exhibit easily observed and characterized mutant morphologies at 37°C.

Chemosensory Response



Examine cell response to a variety of substances at various physiological levels, from avoidance/attraction response to modification of ciliary beat. Analyze results, design and execute independent experiments.

Growth and Population



Address cell growth and population effects by examining lag, log, and stationary phases in microbial cultures. Lab can easily be expanded to encompass questions of population density and sustainability relative to environmental resources. Students encouraged to develop their own questions addressing a range of topics from population growth in response to food abundance and shortage to the effects of environmental change (temperature, salinity, water quality, introduction of competitors) on population growth and maintenance.

Pond Life



Explore the vast array of microscopic life in nearby waterways. Hands-on investigation of the natural world introduces students to the diversity of organisms that exist in something as seemingly simple as a drop of pond water.

Phagocytosis



Feed cells India ink particles and monitor food vacuole development over time. Open ended lab encourages students to make observations, analyze results, and design and carry out their own experiments.

Effects of Smoke and Alcohol



An examination of the effects of cigarette smoke and alcohol on living cells. Toxic effects on ciliary beat, swimming behavior, and viability easily demonstrated using the provided cigarette smoke extract and alcoholic and non-alcoholic beer. Useful in science and health classes at all levels.

ASSET Science and Society

Biology and Society Consensus Conference



Students discuss and debate the critical interaction of basic biological research, biotechnology, and society in interactive ways that stimulate student thought and participation. Other modules address issues relevant to the interface of science and society, fostering an interdisciplinary approach and outside the box thinking.

Independent research

Tetrahymena based student research



Foldscopes and ASSET

Perfect partners



This project was supported by the Office Of The Director, National Institutes Of Health under Award Number R25 OD020230-02. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

ASSET in the Classroom



Local Teacher Workshops



ASSET sponsors teachers to provide local mini-workshops to introduce their colleagues to ASSET, allowing small groups of teachers to explore the use of ASSET materials locally at a fraction of the cost of on-campus workshops.

Sharing and Dissemination

We are eager to share ASSET modules with other outreach groups.

We can provide materials and training to support collaborative efforts. If you are interested in discussing ways that ASSET materials might fit into your program or benefit your teachers, please contact us.

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