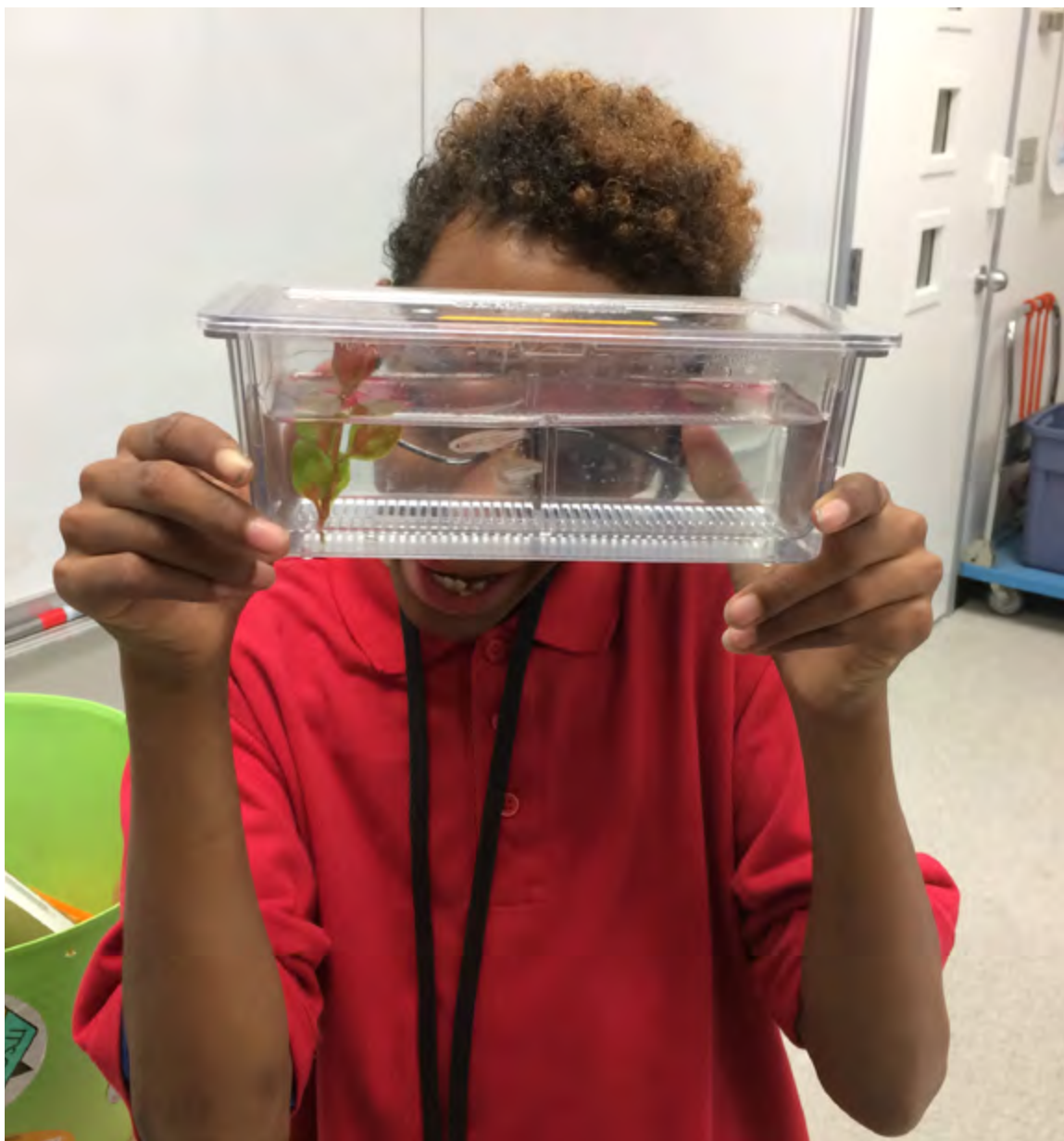


STARTING BIOEYES

GET STARTED GUIDE





BENEFITS TO STARTING BIOEYES

Here is what you will gain...

- ✓ Enhancement of K-12 science in your community
- ✓ Learn how to deliver an evidence-based model of hands-on science in your community
- ✓ An opportunity to have students model the practice of being a scientist
- ✓ Create a student-driven, engaging science experience
- ✓ An increase in students' knowledge and attitude towards science
- ✓ Fulfill “broader impact” commitments that faculty have with federal grantors

Here is how we will support you...

- ✓ Provide a hands-on classroom based teacher training
- ✓ Assist you in building the program and piloting it
- ✓ Continue to provide support after the pilot
- ✓ Share resources for disseminating the program and sustaining it
- ✓ Provide evaluation data
- ✓ Tailored curriculum that meets your local, state and national standards and needs
- ✓ Work with you to ensure all requirements are met
- ✓ All sites work together to develop new curricula, teaching materials, and overall program goals

STARTING BIOEYES - OVERVIEW

Thank you for your interest in the BioEYES zebrafish program! If you are part of a university or research center and want to deliver BioEYES to a school, camp, group, or as part of a larger outreach effort, below are the steps to getting this program started.

- 1. Who will oversee the program?**
 - a. Professor, researchers, zebrafish scientist, other
- 2. Who will supply the zebrafish?**
 - a. Zebrafish facility onsite at your location
 - b. Order zebrafish embryos online if needed
 - c. Obtain local Institutional Animal Care and Use Committee (IACUC) approval
- 3. Sign our Memorandum of Understanding**
- 4. Host a talk to gain interest and stakeholder support (optional)**
- 5. Identify your BioEYES educator**
 - a. Paid educator, grad/undergrad students, volunteers, or teachers to lead the program in the schools
- 6. Identify your audience**
 - a. Number of schools
 - b. Student age range
- 7. Connect with your audience**
 - a. Contact a teacher, school, or other group
- 8. Raise funds**
 - a. Budget for Outreach Educator, supplies, and travel to/from schools
 - b. Consultation fee may apply, depending on your particular effort
- 9. Obtain supplies and hire Outreach Educator**
- 10. Schedule your BioEYES training**
 - a. Visit an existing BioEYES center or have them come to you
- 11. Implement a pilot**

WHO WILL OVERSEE THE PROGRAM AND SUPPLY THE ZEBRAFISH?

Typically there is a professor, group of researchers, and/or a zebrafish scientist who serve a critical role in establishing and running this program at your institution. This person usually provides access to the institution's zebrafish facility. We are open to other configurations, however, as long as there is a source for the fish. Identify who these contacts will be and then we will assist with Institutional Animal Care and Use Committee (IACUC) paperwork in order to bring live fish into the classroom.

We also ask that you sign our **Memorandum of Understanding**.



Dr. Steven Farber, zebrafish researcher and co-founder of BioEYES.

GAIN INTEREST AND STAKEHOLDER SUPPORT (OPTIONAL)

Consider **hosting an education talk** to gain interest and enthusiasm in your department and possibly throughout your institution. This event could also uncover some available sources of funds. We can help you with this.

Show your stakeholders the data

- ✓ On our website we have listed the academic standards that our program covers. (bioeyes.org/standards)
- ✓ We also evaluate students' knowledge of and attitudes towards science before and after they participate in the week-long lab. See the results in our 2016 paper published in *PLOS Biology*. (bit.ly/PL0SBioEYES)

IDENTIFY YOUR BIOEYES EDUCATOR(S) AND YOUR AUDIENCE

Do you want this at one school? Multiple schools? Do you prefer a certain student age group?

Decide who will be the educator(s) that goes into the school to deliver/teach the program. This could be a paid outreach educator, graduate students, undergraduates as part of a course, volunteers, or a classroom teacher that you partner with.

At our primary centers we employ paid educators who visit a different school each week. But in Massachusetts, for example, they have grad students that volunteer to deliver BioEYES to 1-2 schools during one month of the year only.



BioEYES Baltimore Outreach Educator Rob Vary helps a 7th grade student observe a zebrafish larva under a microscope.

CONNECT WITH YOUR AUDIENCE

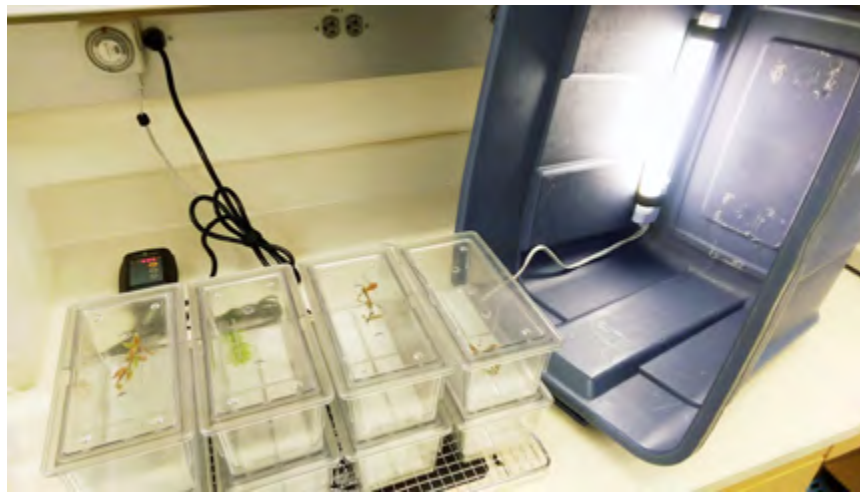
Make a connection with a teacher, school(s) or other group and pick a week when that group will participate. Many education departments already have university/school partnerships with specific K-12 schools. Reach out to colleagues to see if there are connections already established.

RAISE FUNDS AND OBTAIN SUPPLIES

Identify revenue and partners within your institution that might want to see a program like this implemented. Work with your development office to raise funds. We have a sample grant proposal that can be revised for your needs.

Budget:

If you employ an Outreach Educator to deliver the program throughout the school year to approximately 2,000 students (9-10 month position, September-June), the cost is roughly \$65K/year. This includes salary and benefits. Additional funding is needed for educator travel to/from schools and for supplies, noted below. We also have a consultation fee which will be determined based on your particular effort.



The light box setup, where the fish and embryos are stored in the classroom.

Basic supplies you will need:

- ✓ 2 microscopes and carrying cases
- ✓ BioEYES student journals (purchase from us)
- ✓ Carboy (to transport water for mating tanks)
- ✓ Mating tanks (one setup per group)
- ✓ Adult mating zebrafish (one pair per group)
- ✓ 2 watertight containers (to transport fish)
- ✓ Conical tubes (to transport embryos)
- ✓ Wash bottles (for embryo medium, one per group)
- ✓ Fine mesh net for embryo collection
- ✓ Petri dishes
- ✓ Pipettes
- ✓ Fish nets
- ✓ Reptile heating pad
- ✓ Plug-in thermostat
- ✓ Extension cords
- ✓ Wire baking rack
- ✓ Plastic bin for storage
- ✓ Fluorescent light
- ✓ Plug-in timer
- ✓ Transport cart

SCHEDULE YOUR BIOEYES TRAINING

You must provide travel & accommodations either for your staff to come to Philadelphia or Baltimore, to get trained, or for one of our staff to come to you. If we come to your location then you are welcome to invite others (e.g., classroom teachers, staff, other stakeholders) who will take part in delivering, supporting, and receiving the program. We prefer to model the lessons for you in the classroom with students, but if that is not possible to set up then we can do a mock BioEYES experience.



Fifth grade students observing their zebrafish while participating in Project BioEYES.

IMPLEMENT A PILOT

Pilot the BioEYES program at a local school, camp, or group educational setting. We will provide a follow-up consultation with you as well as the results from our pre and post surveys that we ask you to administer to the students.

Sample Timeline

- ✓ Hire Outreach Educator (OE): Summer
- ✓ BioEYES travels to you to lead teacher training (your OE observes): Summer/fall
- ✓ OE observes 3 days of the program in schools at a BioEYES Center: Fall
- ✓ OE co-teaches alongside BioEYES staff (optional): Fall
- ✓ OE implements BioEYES autonomously: Starting in January

BIOEYES LOCATIONS

Primary Centers



**University of Pennsylvania
(Philadelphia, PA)**



**Johns Hopkins University
(Baltimore, MD)**

Secondary Centers



**Mount Sinai Hospital
(New York, NY)**



**Monash University
(Melbourne, Australia)**

**Williams College
(Williamstown, MA)**

**Fontbonne University
(St. Louis, MO)**

Satellite Sites

**Pennsylvania Society for
Biomedical Research
(Philadelphia, PA)**

**Kids Interested in Science,
Engineering, and Technology
(Atlanta, GA)**

**Ohio State University
(Columbus, OH)**

**University of California, Irvine
(Irvine, CA)**

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