

Our OASIS

An elementary science summer day camp uses high school mentors to get students excited about science.



By Lisa S. Bircher and Bonnie Sansenbaugher

Holding a day camp at your school is a perfect way to get your students interested in learning science in their community. We created an elementary science summer day camp at our school for students in grades K–4, aided by high school (grades 9–12) student mentors. Our camp allows participants to make connections to the natural world and piques their interest in learning science. The high school students act as camp mentors, engaging in planning and implementation, while our elementary students learn basic science from their older peers. Meanwhile, we teachers watch the magic of learning science take place for all involved.

Schoolground Use

We dedicated our school's OASIS (Outdoor Area for Studies in Science) to the community several years ago

and were pleased that we received press coverage for the dedication event. This outdoor area adjacent to the school includes 48 acres of woodlot, a pond, open meadows, and existing game trails. We also placed some picnic tables and created a short loop of trails in this area to make teaching in the environment possible. As a result, we have received community donations to help fund the space and add materials (e.g., picnic tables, gravel for trails) that help us teach in this environment.

Our designated OASIS is a perfect location for formal and informal studies in science; however, any outdoor area near the school will do. For the past four years, we have used the OASIS over multiple days (usually Mondays, Wednesdays, and Fridays) for our elementary science camp week, but we also use other areas for our Science Camp activities, such as high school classrooms, our local park, and the practice field on campus.

High School Student Mentors and Service-Learning

Planning for Science Camp begins in fall. We hold after-school meetings with high schoolers from our campus who are interested in volunteering to be mentors. We informally meet with chosen mentors four or five times for 30 minutes to determine themes for each day of the camp. Themes grow out of previous years' evaluations, as well as mentors' specific science interests. For those who do not have a high school included on their school campus, a relationship with local high school teachers and club advisers must be established. Then, teachers and advisers can make recommendations for suitable mentors.

We often find that the high schoolers take their planning seriously and are excited to consider activities to do, games to play, lessons to teach, stories to read, and songs to sing with their elementary peers. They suggest ideas for investigations (i.e., elephant toothpaste for Chemistry Day), crafts, and even write their own songs (see Figure 1, p.48, for details about each day of camp, areas covered, and activities). We also particularly enjoy using *Growing Up WILD* (see Resources) as a guide for planning engaging lessons for camp.

The camp generates more than interest in science: It also creates stronger connections among community mem-

bers and students across grade bands. We have found that our place-based efforts and dedication to service-learning are of the utmost importance. Service-learning incorporates education with community service. We have noticed that students are more willing to volunteer and commit to community service as a result of mentoring science camp. Research shows that other community science camps create similar connections in a community (Hymer 2005; Morrison and Uslick 2002; Wiig 2002). What is unique about our science camp is that high school students plan the lessons, refine and practice camp activities, prepare all of the materials, and implement these plans that they have designed themselves. As teachers, we serve only as guides who assist students in planning, and we prompt our mentors when needed to keep the program moving.

Planning for Science Camp

We recruit elementary students by sending fliers and applications to each student in April or May. Parents return applications to the school office, along with a \$30 fee to cover the costs of consumable materials used during the camp. We accept applications on a first-come, first-served basis. Thus far, we have not turned away any potential campers. However, 40 campers seems to be the maximum number we can accommodate at present. We have found that application fees have easily sustained the financial needs of the camp. Note that it is important to include a space on the application to record any medical conditions or allergies campers may have.

When we plan Science Camp with our high school mentors, we take time away from our busy lives to immerse ourselves in thinking, planning, implementing, and preparing what we will need. During a weekend approximately six weeks before Science Camp begins, we meet with our mentors in a retreat setting at a local summer camp. Our informal meetings with mentors provide an outline, and the retreat allows us to fill in the details. This training does not necessarily need to take place overnight, but it does need to be completely focused on the work at hand. At the retreat, we attempt all lessons, read the books to be used, and, most importantly, spend time with the dedicated high school mentors who are interested in teaching their elementary peers.

While at the retreat, the high school students examine the plans for each day of Science Camp, as sketched out during the informal after-school meetings in early spring, and dive into the activities. Smaller groups of mentors often focus on one particular part of Science Camp and work to perfect those lessons, games, activities, and crafts. Students work on projects they are comfortable conducting. It is interesting for us as teachers to find unlikely leaders emerge from this group of high school students as they



plan for camp. By the end of the retreat, we work with mentors to produce a detailed outline of all activities for camp and attempt to sequence and time the events to meet our allocated schedule. Each summer provides a different set of experiences for campers in that we host return campers each year. Therefore, we engage in new topics of study for each summer.

Science Camp Agendas and Activities

We require mentors to arrive 30 minutes before each day's official start of Science Camp. This allows us to review the agenda for the day and set up materials. We identify tasks for each group of mentors as determined in a brief (30–40 minutes) precamp meeting that takes place the weekend

directly before camp begins. At this meeting, we are able to prompt the mentors in charge of each activity to prepare their materials in a location that suits them best.

As Science Camp is being conducted, we keep a close eye on the time and make sure to move on to the next activity punctually. This can be a challenge, but staying on schedule makes the entire camp proceed seamlessly. We also encourage each mentor to be responsible for certain materials, so we know exactly who will be ready with those items.

Each day of camp consists of at least one game, song, lesson, hands-on activity, and read-aloud from a high-quality picture book, which are differentiated by grade and ability (see Resources for suggested texts for teaching about rockets on Physics Day). We also use stations to manage small groups, differentiate, and allow mentors to develop relationships with the campers. Much like the regular science classroom,



FIGURE 1.

Science camp agenda.

Please keep this page at home so you know where to report each day and what the activities will be!

Day 1: Monday June 6, 2016

Theme: Earth Science

Meet at EPHS Flagpole at 10 a.m. and walk to OASIS, pickup at noon

1. Decorating science camp lab coats
2. Rock types, fossil forms, and fossil song
3. Make fossils with Plaster of Paris
4. Fossil finder board game
5. Story time using age-appropriate books about fossils and dinosaurs

Day 2: Tuesday June 7, 2016

Theme: Environmental Science

Meet at EP Park basketball courts at 10 a.m., pickup at noon

1. Recycling song, talk by representative of Environmental group
2. "Clever Catch" recycling game and race
3. Storytime using age-appropriate books about importance of recycling
4. Sorting trash and recyclables
5. "Trash to treasure" craft

Day 3: Wednesday June 8, 2016

Theme: Physics

Meet at EPHS Flagpole at 10 a.m. and walk to OASIS, pickup at noon

1. Relay race on aerodynamics
2. Activities on motion, force, and friction with toy cars
3. Story time using age-appropriate books about rockets
4. Building and launching rockets
5. The "Rocket Chant"

Day 4: Thursday June 9, 2016

Theme: Life Science

Meet at EP Park basketball courts at 10 a.m., pickup at noon

1. Lesson on growth and development, migration, and invasive species
2. Migration song
3. Frog development craft
4. Ellie and Ollie Eels story time
5. Identify babies and adults walk

Day 5: Friday June 10, 2016

Theme: Chemistry

Meet at EPHS Flagpole at 10 a.m. and walk to OASIS, pickup at noon

1. Lesson on chemical versus physical changes
2. C-H-E-M-I-S-T-R-Y song
3. Make elephant toothpaste
4. Make flubber
5. Make your own ice cream snack
6. Evaluation of Science Camp in room 308 EPHS



appropriate safety procedures must be implemented at Science Camp (see Internet Resources for NSTA's safety position statement). For example, on Chemistry Day at our most recent Science Camp, we purchased safety goggles and lab coats for each participant, including mentors. These safety materials were then sent home with students for future use.

Physics Day represents a good example of what each day at Science Camp is like. At our most recent camp, participants designed, built, and launched rockets. We incorporated read-aloud texts and found that campers asked many questions during reading time. The next part of the day involved building the rockets. This took more time than expected, but it was worth it for the discussions that ensued about aerodynamics and creating the best rocket. We also included an activity in which campers could test the movement of toy cars on ramps to determine how forces could result in differences in motion.

Evaluation of Science Camp

At the end of Science Camp, we invite parents to complete an evaluation of the camp with their child. We provide space for parents to talk to their children as they complete the evaluation. Ninety-three percent of parents surveyed gave us "excellent" evaluations of their children's experience while at camp. We received an even higher rating of 95% "excellent" for staff work, with many citing the efforts of the high school mentors as most significant.

Continued evaluation of Science Camp allows us to demonstrate the impact of our program on the elementary and high school student mentors, and we are more likely to receive future funding and volunteer assistance. We received suggestions from parent and camper evaluations for future improvement, including: conduct more investigations, find out what campers are interested in learning

about, include more hikes and outdoor experiences, and make use of microscopes for some investigations.

It is helpful when reviewing evaluations to find what campers enjoyed the most. In our first year of Science Camp, a favorite activity was fishing. We were able to get fishing poles donated for each camper, and they took them home at the end of camp. Other favorite activities from camp include investigating chemistry, rocket building, hiking, singing, and fossil exploration. Overall, we were pleased to receive comments about specific activities that we can incorporate into future camps. As we review our evaluations, we take time to read them aloud with the high school mentors in a special lunch we treat these students to after camp. It is always enlightening to see the high school mentors' responses to parent feedback. The feedback allows us to plan and prepare for the following year. For example, campers responded well to experimental activities and this enabled us to incorporate more of these into our agenda.

FIGURE 2.

Recommendations when starting a science camp.

- You will need a core group of about 8 to 10 reliable high school students who are willing to come every day of camp. The elementary students look forward to interacting with the same students each day.
- Keep elementary student groups small so all campers have quality time with the high school mentors.
- Keep activities and crafts simple. Complex crafts are confusing and students will lose focus.
- All high school students should take turns being the lead educator for at least one activity, song, or craft. The elementary students will respect them more.
- Be aware of all student allergies and medical conditions before camp begins. Have a plan for this.
- High school students should already know who will be responsible for each activity before the campers arrive. Materials should be prepared and lessons rehearsed.

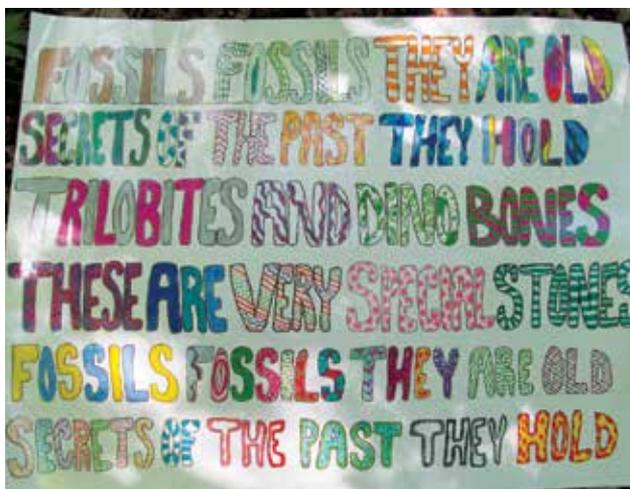
Planning for the Future

After organizing science camp for three years, we now have an evolving vision for our future camps. We have agreed that we do not want to enroll more than 40 students in our day camp to maintain a high level of educational quality and maximum mentor contact. We do like that each year has had a theme, and we will continue to plan future camps to involve days dedicated to specific science concepts.

We also agreed that future planning must include new, younger mentors, as well as seasoned past mentors, to maintain the quality planning that has been established by our founding high school mentors. We will include topics that interest the high school mentors so they are excited about what they are teaching the younger children. We will continue to hold a planning retreat, because we feel it is vital to have uninterrupted planning time to create high-quality lessons. We will also continue to ask parents for feedback to drive future planning.

It is helpful to know what topics interest elementary students. In an effort to determine these students' prior knowledge, we will attempt to establish baseline knowledge through preassessment on the first day of camp during registration and check-in time. High school mentors will take notes on elementary students' understanding of concepts. This will allow us to chart growth throughout the week and post-assess knowledge at the end of camp. Furthermore, we believe it would be beneficial to solicit mentor feedback about their experiences as teachers. To help our summer science camp grow, we are also considering including community members as guest speakers or sponsors. See Figure 2, p. 49, for our recommendations for starting your own science camp. ■

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This fossil song was created by high school mentors.

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References

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- Morrison, G., and J. Uslick. 2002. Summer science camp, anyone? *Science and Children* 39 (7): 34–37.
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- Wiig, D. 2002. A week with the stars. *Science and Children* 39 (7): 22–25.

Resources

- Council for Environmental Education (CEE). 2012. *Growing up WILD: Exploring nature with young children*. 6th ed. Houston, TX: CEE.
- Eason, S. 2010. *How does a rocket work?* New York: Gareth Stevens Publishing.
- Mitton, T., and A. Parker. 1997. *Roaring rockets*. New York: Kingfisher.
- Zobel, D. 2010. *NASA*. Minneapolis, MN: Bellwether Media.

Internet Resources

- 4-H National Youth Science Day: Rockets to the Rescue
<http://4-h.org/parents/national-youth-science-day/rockets-to-the-rescue>
- NSTA Position Statement: Learning Science in Informal Environments
www.nsta.org/about/positions/informal.aspx
- NSTA Safety in the Science Classroom, Laboratory, or Field Sites
www.nsta.org/docsSafetyInTheScienceClassroomLabAndField.pdf



See www.stillplayingschool.com/2015/03/frog-life-cycle-recycled-craft.html for details on how to create this frog life cycle craft.