Sunstone MONTESSORI SCHOOL

Middle School Developments

March

We have had quite a few families (and prospective families) join us since our last newsletter. Welcome!

This month I'll discuss how our community of practitioners fit into our educational program. I'll also provide some links to previously discussed topics, so we're all up to speed.

Calendar

- **March 30**: Middle School Campus Tour
- **April 13**: Middle School Campus Tour
- **May 4:** Middle School Campus Tour
- **May 25:** Middle School Campus Tour

Learn More & Schedule Your Tour

Housekeeping

I want to acknowledge that you all are here for various reasons: your child may be enrolled for this fall; your child may join our middle school next year; you may have a toddler or high schooler and are eager to volunteer on our farm; your middle schooler may have enrolled elsewhere and you want to remain a part of our community.

For those who do not need regular communication, you are in the right place: this newsletter will soon become a way to announce special events at our Milwaukie Campus, and within our Middle School community.

For those who *are* enrolled at our Middle School, I'll automatically add you to a separate newsletter. Please let me know if you are not enrolled in our Middle School, and would like more regular communication.

Previously Discussed Topics

Before you read about our community of practitioners, be sure you're up to date on these basics of our middle school programing:

- Jennifer Ryznar, our Math and English Language Arts Guide, and the role of the adult in a Montessori adolescent program
- Sam Hall, our Music and Digital Media guide, and our integrative curriculum
- The Prepared Environment, and why we pair toddlers with adolescents
- Plans of Study & Work, and how we structure our educational programming around these hands-on projects

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Community of Practitioners

Thus far, these newsletters have focused on our educational program as done on our campus, and

guided by our core team of adults. These pieces alone, however, can only get us so far in our mission to expose students to the world, provide them with meaningful work, and help them build the skills needed to become joyful adults who contribute to society. To complete this mission, we turn to our community of practitioners, which includes both adults and adolescents at other schools.

Practitioners Who Bring Meaningful Work

After ensuring a safe and nurturing environment, our principal task is to provide students with "meaningful" work. *Meaning* arises from work that addresses the needs of our land and our community; meaning amplifies as students make this "real-life" work their own. That is, as students sculpt projects to fit their own strengths, personality and shifting interests. With the right practitioner, students can go deep into a particular science, form of writing, or mode of personal expression.

The network of practitioners, who have agreed to work with our students, is what we refer to as our community of practitioners.

Students gain confidence as they work side-by-side with these practitioners, who are often highly experienced in their field. Students see how a career can form around what started as an interest. As students complete projects, they often present their findings (which might be a report, an object, a song, or anything else) to these practitioners– an excellent way to get the best work out of students.

Practically speaking, our core team of adults could never anticipate the unexpected interests of a teenager. Adolescents will often surpass our skills in a particular field, or top our knowledge on a particular subject.

There are as many different ways for practitioners to work with us as there are practitioners. Still, we can categorize a few common ways students and practitioners interact.

Practitioners Who Collaborate on Campus Projects & Core Curriculum

Mihir Ravel is a practitioner who specializes in applied science and engineering. Following a career in which he led teams of engineers in corporate environments, Mihir now designs project-based curricula for middle and high school students. He specializes in simple tools that students can use, and build, themselves. Mihir and I have already played around with DIY microscopes and simple

filters to categorize soil texture and calculate drainage capabilities. Students can use these tools as they take on campus projects, which might relate to animal health or improving our riparian habitat.

Additionally, Mihir is passionate about guiding students toward positive, can-do feelings in the sciences. He sees simple engineering projects as the way to do this, which he has written about here:

PRACTICAL RESEARCH

The Benefits of Integrating Engineering Into Science

Evidence From 21st-Century Research

BY MIHIR K. RAVEL AND CARY I. SNEIDER

Middle school is a pivotal time in each student's life when an inspiring experience may grow into a lifelong passion, or a spark of interest can easily be extinguished by a discouraging comment. Our recent review of 263 research studies of engineering education confirmed the importance of a positive middle school STEM learning experience (Sneider and Ravel 2021; see link in References to download article for free). Our review also identified evidence-based methods for effectively teaching engineering to students of this age. To translate these research findings into useful teaching directions, we address several key questions in this brief: Why middle school? Why engineering? What works? and Why does it matter?

Why middle school?

Two decades ago, the consensus among education researchers was that high student interest in science at the elementary level tended to decline as students entered middle school, followed by a precipitous drop in interest during high school (Osborne 2003). But recent studies have shown that the situation is more nuanced and hopeful. For example, Falk et al. (2016) surveyed students in a low-income urban community, starting when they were in fifth grade and following them over four years. Questions on the survey were not about "science" in general, but rather about specific activities related to science and engineering. Although about 25% of the sample did show a decline in interest, for another third of the students, science and math interest remained high and interest in technology and engineering *increased*.

An important finding is that developing an interest in STEM before students enter high school is a remarkably strong predictor of future success. Tai et al. (2006) found that students who expressed interest in STEM careers in eighth grade were more than 300% as likely to complete a four-year degree in science or engineering than those who did not. Sadler et al. (2012) asked 6,860 college students about their career interests at various points in their lives and found that the single most important factor in aspiring to a STEM career was interest at the *start* of high school. These findings underscore the lasting impact of engaging middle school students in STEM.

Why engineering?

Many studies showed that when engineering is introduced as a part of science, engagement is significantly increased. That's not surprising. Engineering is hands-on. It is creative. It involves teams working together to solve a problem. It's the kind of activity that most students enjoy—not just those who tend to perform well on tests.

For example, Barnett (2005) studied a low-income, inner-city school with chronically low attendance. The study compared one class of 25 students who designed remotely operated underwater vehicles (ROVS) with 32 students who studied the same physics concepts (floating, thrust, and density) in traditional

Mandy Stanford is another practitioner from our community, who has already lent her expertise on animal husbandry and education. Mandy has worked for institutions including The Oregon Zoo, where she helped take care of various species, and built educational programing around these animals. Mandy will be an excellent resource for those students who want to dive deep into the care of goats or chickens, and how to enrich their lives on our campus.

Like Mihir, Mandy has done some fascinating research on applied (hands-on) education, this time with animals:

IZE Journal 50 (2014)

Can I touch it?: Zoo program impacts

Amanda Stanford, Program Animal Staff, Oregon Zoo, USA

Abstract: *As modern zoos strive to fulfill their conservation education missions, many seek to engage and inspire visitors by offering various contact experiences with animals. This study examined the impact physical contact with rats and snakes had on children's attitudes towards those animals. The results from short surveys with pictures and simple descriptive words showed that both seeing and touching an animal significantly improved feelings about that animal.*

Introduction

As I gently pull the gopher snake from its carrier, some second-graders gasp, some smile, and others dramatically scoot away. We talk about the snake's diet and habitat needs and how they help control rodent populations. When it is time to touch the snake, the first student scowls and shakes his head vigorously. The next two follow his lead. The fourth one leans forward for a tentative stroke. "Ohhhh, it's so soft," she says. After that, most of the children touch the snake, adding more adjectives: "Bumpy," "rough," "like a basketball," "like plastic." When I'm done, I give the original skeptics a second chance to touch the snake. They tentatively reach out their curious little fingers and don't look nearly as repulsed. Their smiles remind me why I am in this profession.

Most zoo educators can describe similar moments in which students overcome – or at least question – their preconceived notions about animals. Whether the degree of this shift is measured or not, it feels significant at that moment.

Increasingly, studies are examining how modern zoos impact visitors' environmental attitudes (Marino et al. 2010; Rabb 2004; Smith et al. 2008). However, the findings are inconsistent. What's more, most studies have focused on adult education and attitude change (Falk et al. 2010; Marino et al. 2010). While engaging adults is important, Kahn (2002) argues that children should be the focus of conservation movements. Since more than half of Americans now live in urban areas, many children will not regularly experience nature as they grow up (Miller, 2005). For these children, the local zoo may be their closest or sole encounter with plants or animals. The presence of urban children at zoos therefore provides an opportunity to reach a population that may lack positive nature experiences. As Randler et al. (2012) explain, positive attitudes towards animals can translate to an interest in protecting animals and the environment. Zoos already present a multitude of animal programs designed for children and are in an ideal position to influence the next generation. But what is the true impact of these programs? This study approaches one aspect of this question by looking at how touching an animal impacts children's attitudes towards that animal.

Methods

Designing the Study

Working to fulfill their conservation education mission, the Oregon Zoo's Program Animal staff present classroom programs to around 5000 kids per year. This study was conducted in the Pacific Northwest-themed programs for 2nd to 5th grade classrooms. Focusing on local wildlife, students in these programs saw, and sometimes had the opportunity to touch, a Norway rat (*Rattus norvegicus*) or a gopher snake (Pituophis melanoleucus). They also saw, but did not touch, a Western screech owl *(Otus kennicotti)*.

Simple, one-page surveys were designed with three questions each about a rat and a snake. The two questions evaluated for this study asked students 1)

Practitioners Who Will Share Their Workspaces

Other practitioners make their workplaces, or other locations of interest, available to students.

Nina Avila is the Education Programs Director at Hoyt Arboretum. I have taught a few classes at Hoyt and built up a relationship with Nina and her colleagues. Students may want to visit the arboretum and talk with certified arborists or other specialists. Students will also have the opportunity to assist Nina and her colleagues with educational programing for elementary-aged students.

Another practitioner with a different sort of workplace to share is Renato Rodriguez, a reference librarian at the Oregon Historical Society. Renato has helped us locate historic maps of our new campus. He has graciously offered to show students around the archives at the Oregon Historical Society, and discuss the various careers related to record keeping and library and information sciences.

The Independent Publishing Resource Center (IPRC) is another phenomenal organization, with whom we've worked in the past. IPRC is filled with passionate and engaged employees, and very cool machines for creating zines and graphic designs.

I'll give final mention to Megan Hanson, in the Environmental Services department at The City of Portland (she lent us a watershed model that was hit in Elementary Summer Camp). I would love to have Megan tell us about the intricacies and explain the varied stakeholders in The Big Pipe Project, which might also warrant a trip off campus.

Practitioners Who Help Students Build Specific Skills

Renato at Oregon Historical Society is also a good example of how practitioners will share specific skills with our students. In this case, research skills: How to effectively comb through materials in a library; how to access digital maps and government records; how to cite sources; how to manage information from multiple sources. These are skills that will transfer to many different projects.

Tristan Stoch is another committed practitioner with skills to share. Tristan was on the lighting team for Guillermo del Toro's *Pinocchio*. I know him from my time as a cultural anthropologist, when I researched mycologists, foragers and other mushroom experts (he has worked on this topic as a director and cinematographer). I have asked Tristan to come and lead a multi-part lesson on filmmaking, covering aspects such as narration and lighting. He will also be on-call to answer questions about the process of filmmaking.

Tristan is an excellent example of someone to whom students can present. Who better to provide feedback on the production of a film, or the lighting and layout of a photojournalism project, than a professional in the industry!

Students from Other Schools

We will also collaborate with students from other schools. We have a few high school students excited to come give lessons on goat care, such as hoof trimming. We will also collaborate with other middle schools to expand our student body for group activities such as debate clubs, ethics bowl, team sports or movement classes. A key collaborator in this realm is Puddletown Montessori, a similar sized school who may join us for our fall camping trip (so students get to know each other). With relationships built, we can host them at our campus for group activities.

Whether adults or adolescents, our community of practitioners are available to encourage and push students where needed, complement our core community, and offer support in unique and unexpected ways.

If you have a skill, activity or workplace you would like to share with our student body, please reach out and let me know!

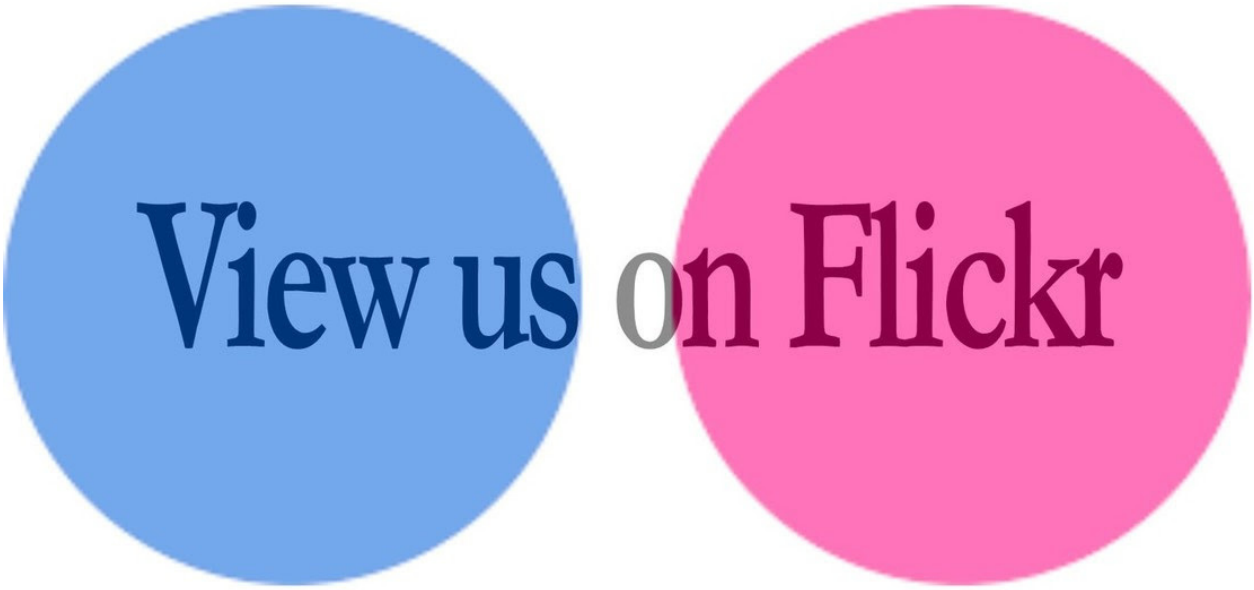
Thanks for reading,

Peter

Stay Tuned!

This newsletter is written by our Middle School Program Director Peter Oviatt. You can find archived newsletters here.

Your thoughts on this newsletter are welcomed: What do you like about it? How could it be more helpful? Please contact Peter with any thoughts or concerns.



Sunstone MONTESSORI SCHOOL

Our Vision:

Our vision is a community of intellectually curious, independent, and compassionate lifelong learners.

Our Mission:

Sunstone Montessori School develops the whole child by providing an academically strong, emotionally nurturing and, socially supportive environment in accordance with AMI guidelines for Montessori education.

Commitment to Diversity:

Sunstone Montessori School welcomes students and staff of any race, disability, veteran status, sexual orientation, gender identity, color, nationality and ethnicity, religion, and family constellation, to all programs and activities at the school. The school does not discriminate in its educational hiring, admission, or school-administered policies. It is our goal that Sunstone Montessori School reflects the rich diversity of our community, including varied cultures, economic status, and individual or special educational needs.

www.sunstonemontessori.org