



Exploring Science and Writing (ExSciTing) for Sheltered Youth

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Abstract

ExSciTing for Sheltered Youth aims to introduce a variety of science topics to K-8 students in homeless shelters through a series of science workshops and hands-on activities widely based on the *NGSS* national science standards. Our goal is to foster an early sense of creativity, critical thinking, and an excitement for learning in these students to make science more approachable and easier to understand.

After a fun and successful run of our pilot program, 100% of parents saw improvements in their child's interest and/or his or her scientific knowledge. With the success of our pilot program, we have already set up the next round workshops with the shelter and their new tenants starting in July. In the future, we plan to *expand ExSciTing for Sheltered Youth's* workshops to other student volunteers and to the next Stanford LEAP cohort.

Need

Homelessness Statistics:

- California ranks 40th in the nation for the number of homeless children¹
- 25% are children under the age of eighteen²
- 1/45 children are forced to undergo homelessness each year in America, culminating to over 1 million children nationwide³

Science Illiteracy Problems:

- Over 54% of high school graduates did not meet the ACT's college math readiness level and 69% of graduates failed to meet the readiness level in science⁴
- US is ranked as 23rd in Science and 30th in Math out of the 65 OECD education systems⁵

[1] http://www.homelesschildrenamerica.org/pdf/report_cards/long/ca_long.pdf
[2] <http://www.studentsagainsthunger.org/page/hhp/overview-homelessness-america>
[3] <http://www.familyhomelessness.org>
[4] https://dese.mo.gov/sites/default/files/college_readiness_issues.pdf
[5] <http://www.pewresearch.org/fact-tank/2015/02/02/u-s-students-improving-slowly-in-math-and-science-but-still-lagging-internationally/>

Curriculum Development

NGSS stands for Next Generation Science Standards and it focuses on the "three dimensions of science learning": Crosscutting Concepts, Science and Engineering Practices, and Disciplinary Core Ideas.

3 Month Plan: One Topic per Month

1. Physical Sciences
2. Earth Sciences
3. Life Sciences

*Our 3 month curriculum conveniently lined up with the shelter's residents' 90-day stay.

Community Partner

Family Supportive Housing provides a full spectrum of services to hundreds of people for whom overcoming poverty, hunger, and homelessness is a daily struggle.



Their programs address the needs of the whole family, including interim supportive housing, childcare, life skills classes, transitional housing and supportive services for families in permanent housing.

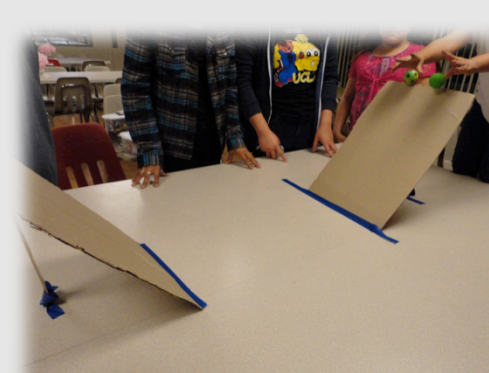
Participants

- K-8 Homeless shelter students in San Jose area
- 10-15 students per workshop
- total of about 30-35 students attended our first workshop series

Workshop Schedule

Week 1: Intro & Forces in motion

- Build ramps, drop marbles at different heights, analyzed effect of height speed of marbles



Week 2: Collision and Changes in Motion

- Make airplanes from cardboard to hang on a fishing line
- Observe what happens when the two planes collide



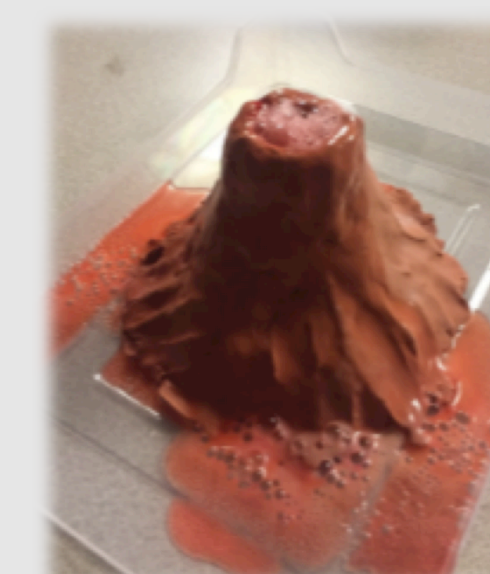
Workshop Schedule

Week 3: Moon phases

- Observe different moon phases using flashlight and styrofoam balls

Week 4: Solar System, Chemical Reaction & Pressure

- Introduce different planets of the solar system
- Demonstrate volcano explosions (Mentos & coke vs. baking soda & vinegar)



Week 5: Photosynthesis

- Plant Marigolds in different conditions under the sun vs. in the dark to compare growth.

Week 6: Diet and Nutrition, Feed-back Session

- Make fruit & veggie kabobs and learn about the nutritional facts



Reward System

- Fruit snacks for participation
- Sticker-Prize reward System:
 - Each participant gains 1 sticker for being present and another for participation in each session.
 - Prize after accumulation of 5 stickers



Reflective Writing

Each participant receives a journal:

- Is passed out at the end of each session
- Allows participants to answer questions on the topics that they learned
- Allows for reflection (Draw or write)
- Aims to foster creative thinking and strengthen written expressions
- Is a good evaluation tool

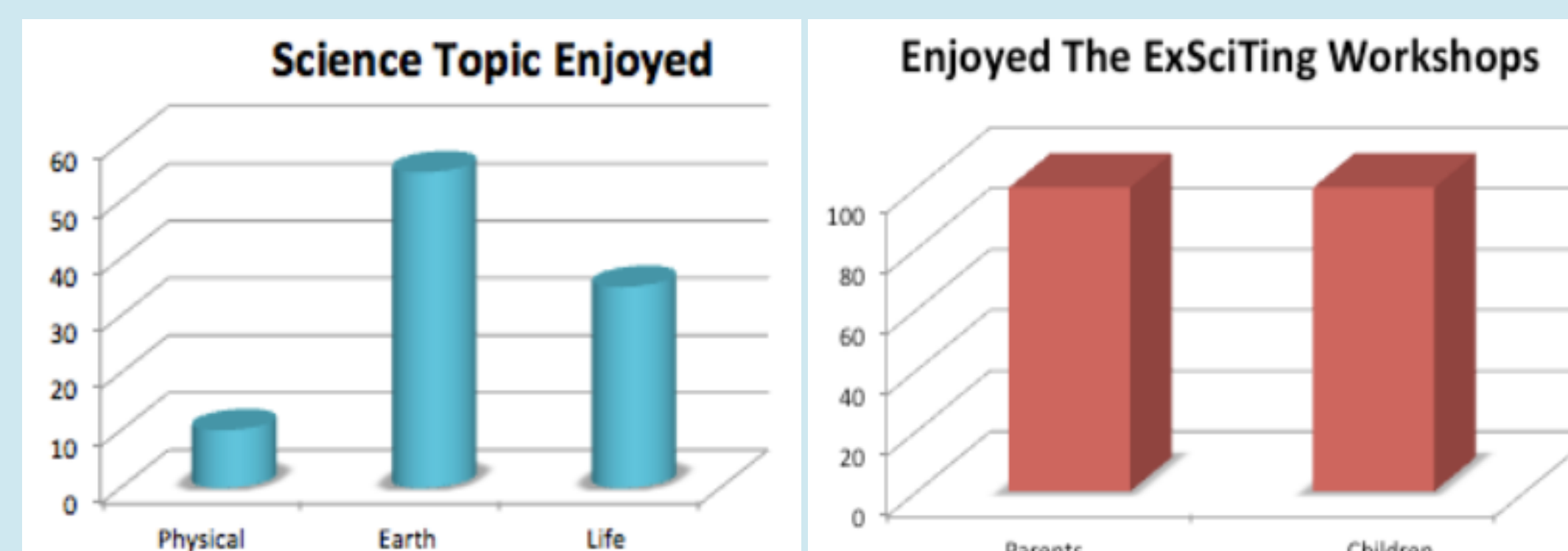


Outcomes

Unexpected Outcomes

- 1.Expected 4-5 students; Outcome 10-15
- 2.Short Attention span, high energy
- 3.Varying levels of scientific knowledge amongst students
- 4.Journal entries needed to be revised - students were more willing to draw responses than write due to poor writing skills (ex. spelling)
- 5.Difficult to keep track with which child leaves within the time frame they stay (3 months)

Participant Responses



Future Directions/Improvements Changes/Recommendations

- 1.Increase the number of volunteers to meet the demands of large participant groups
 - Passionate volunteers will be recruited to ensure weekly attendance to provide participants with sense of consistency
- 2.Change sticker/reward system
- 3.Journal entry system
- 4.Increase frequency of workshops when we have sufficient number of volunteers.

Future Workshops: We have set up our second round of ExSciTing workshops with the shelter we worked with, Family Supportive Housing.

We hope to recruit new volunteers from LEAP and MESA at Mission College to continue the legacy of our project

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