



Does Science Olympiad Kit raise  
3rd grade students' interest in Science?

By Cornelia Ko, MPH

# Introduction

**Background:** Delaware Science Olympiad holds three statewide tournaments for High, Middle, and Elementary schools every year

**Problem:** Low participation rate for elementary schools in Southern Delaware

**Purpose:** The aim of this study is to examine if the introduction of Science Olympiad Kit can increase the interest of the students in science

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## Elementary Science Olympiad In-A-Box



Aerodynamics

Bottle Music

Don't Bug Me

Gummi Bear Long Jump

Metric Mastery

Monster Match

Operation Egg Drop

Rock Hound

Straw Tower

Write It Do It

# Hypothesis

- **H0:** Science Olympiad Kit does not increase the interest of 3<sup>rd</sup> grade students in science
  - **H1:** Science Olympiad Kit increases the interest of 3<sup>rd</sup> grade students in science
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## Methods

- Epworth, North Star, and Forest Oak Elementary Schools took part in this research
  - 134 3<sup>rd</sup> graders participated in this study with their parents' consents
  - Teachers administered a Pretest survey to the students before the introduction of the SO Kit
    - Demographics (Race, Gender)
    - Parents work status
    - ***5 questions to gauge their interest in science and hands-on activities***
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## Methods

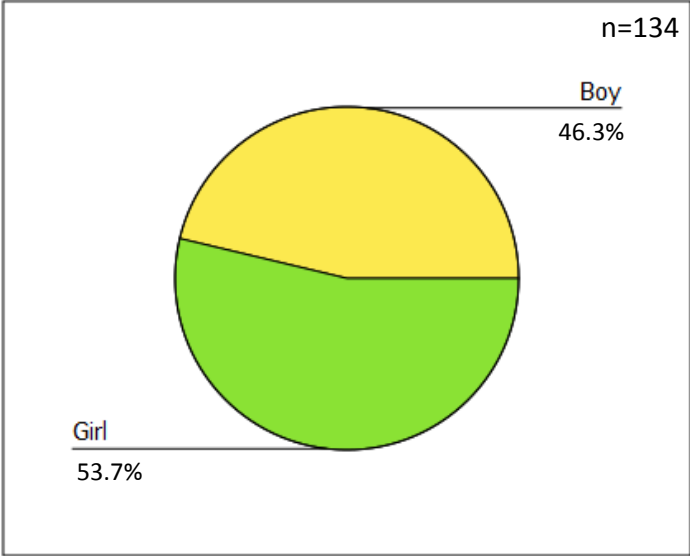
- The teachers used the SO Kit in the classrooms every week for 5 months
  - Frequency chosen by the teacher
    - Epworth – 1 time per week, sometimes 2 times a week
    - North Star – 1 time a week
    - Forest Oak – 2 times a week
  - At the end of 5th month, all participating students filled out the Posttest forms
    - Questions in Pretest forms
    - Feedbacks on the SO Kit
  - Surveys analyzed by SPSS statistically
  - Incomplete forms were excluded in analysis
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## Sample Size

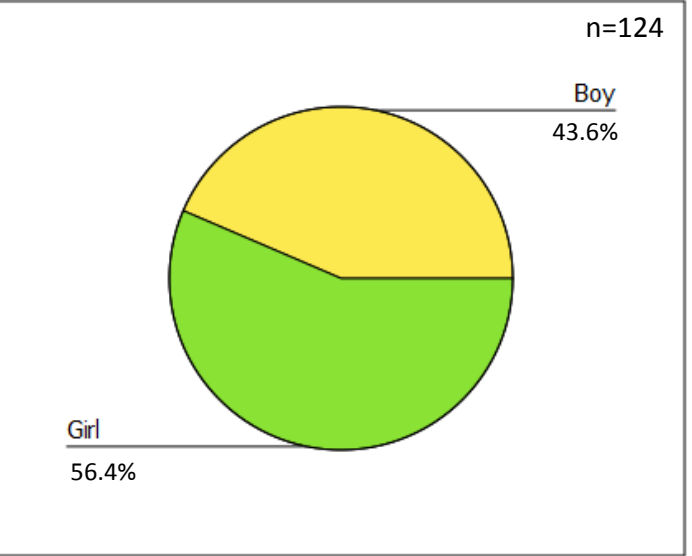
<b>School</b>	<b>Pretest</b>	<b>Posttest</b>
Epworth	9	8
Forest Oak	50	43
North Star	75	73
Total	134	124

# Gender

Pre-test



Post-test

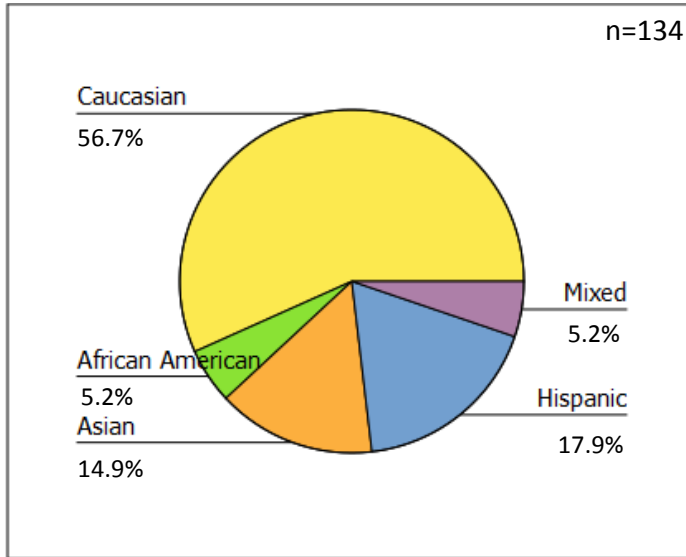




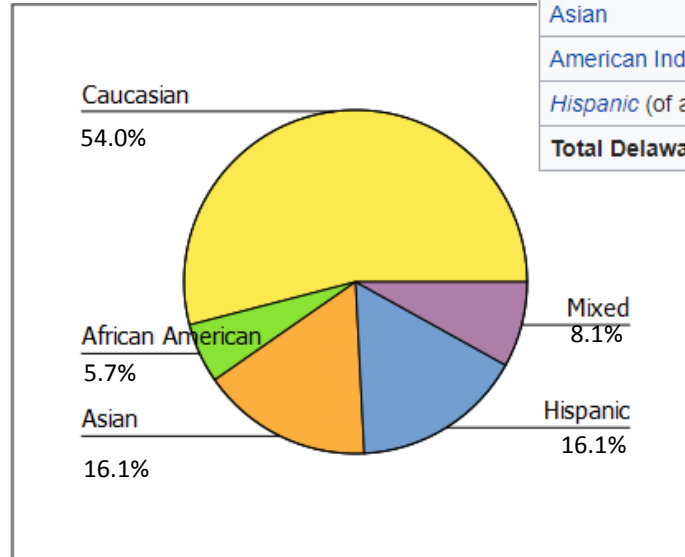
# Race

Race	2013 <sup>[41]</sup>
White:	7,204 (66.5%)
> Non-Hispanic White	5,942 (54.8%)
Black	3,061 (28.3%)
Asian	541 (5.0%)
American Indian	25 (0.2%)
Hispanic (of any race)	1,348 (12.4%)
<b>Total Delaware</b>	<b>10,831 (100%)</b>

Pre-test



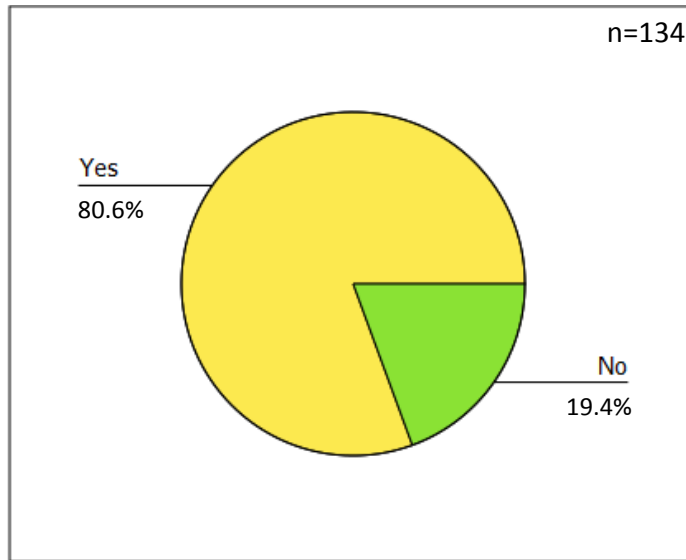
Post-test



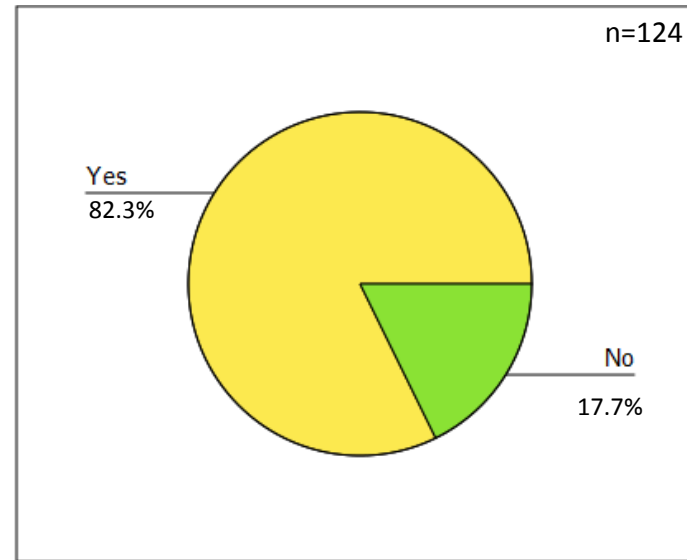
Caucasian and Hispanic (similar to DE State birth data); African American (underrepresented); Asian (overrepresented)

## Does your mother work?

Pre-test

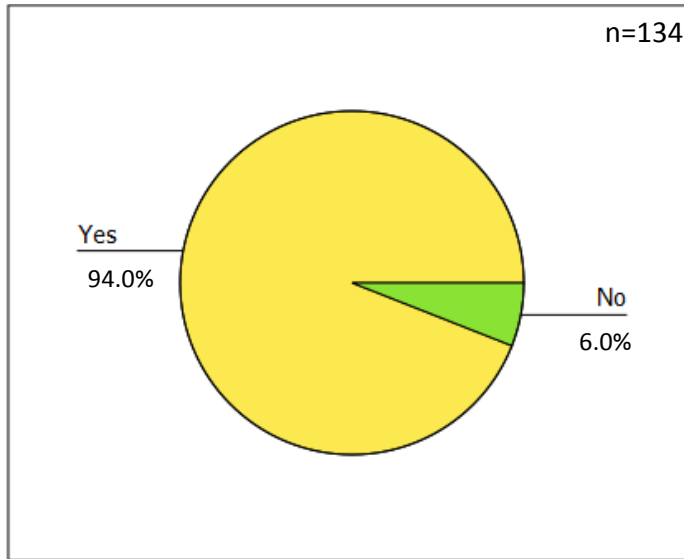


Post-test

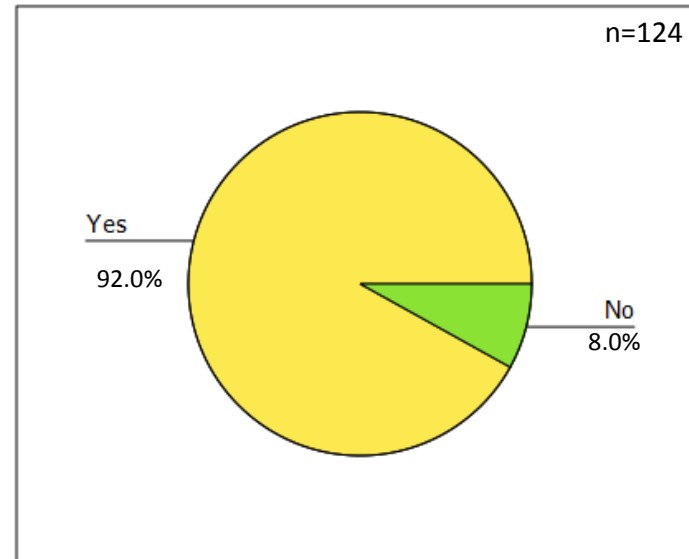


# Does your father work?

Pre-test

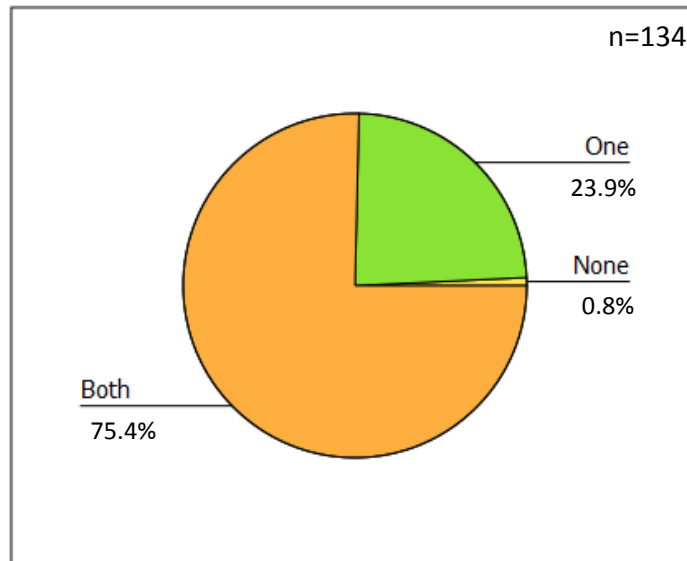


Post-test

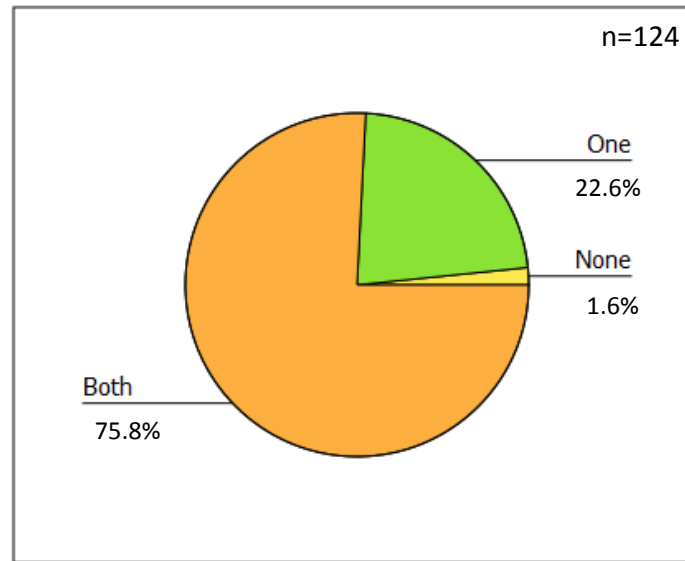


## Number of parents who work in the household

Pre-test



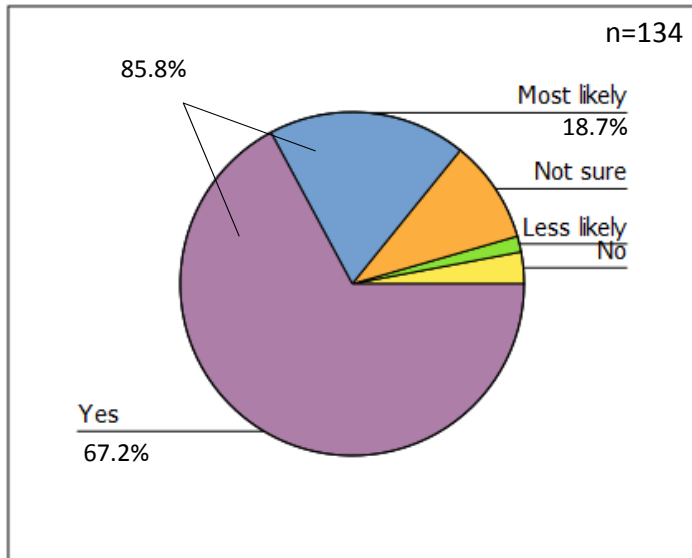
Post-test



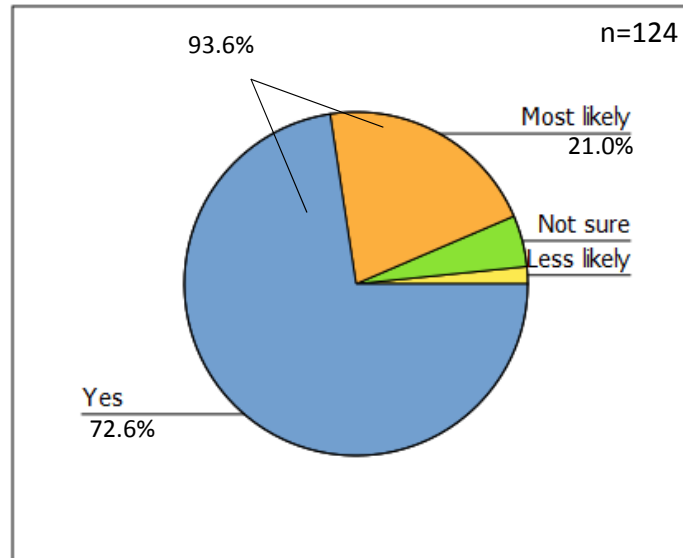
Three-quarter of the students have both parents working.

# Do you like hands-on science activities?

Pre-test



Post-test



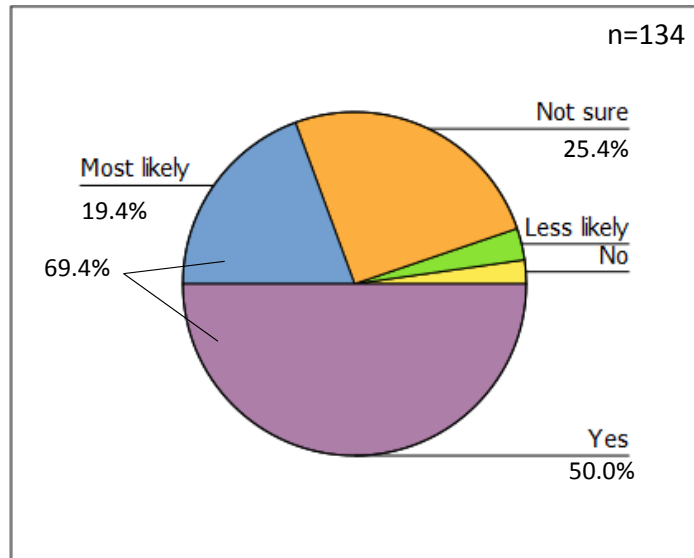
Statistic	Value	df	Asymp. Sig. (2-tailed)
Pearson Chi-Square	6.22	4	.183
Likelihood Ratio	7.82	4	.098
Linear-by-Linear Association	3.43	1	.064
N of Valid Cases	258		

Pearson's chi-squared test ( $\chi^2$ ) is a statistical test applied to sets of categorical data to evaluate how likely it is that any observed difference between the sets arose by chance.

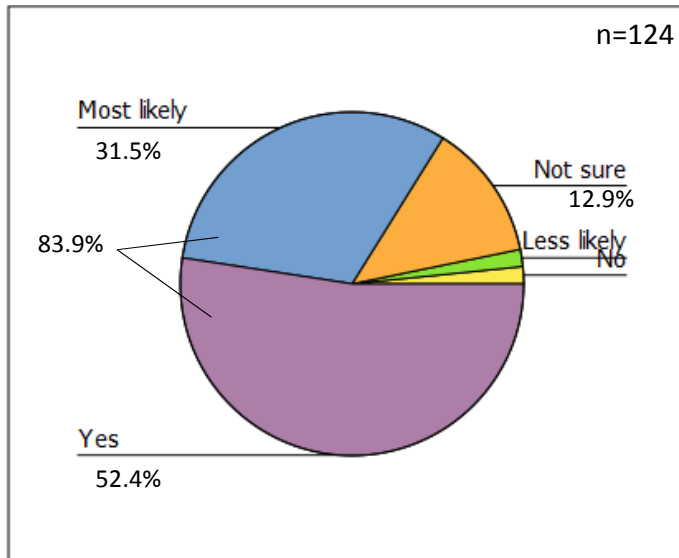
“Most likely” and “Yes” increased by 7.8%. Statistically not significant.

## Do you think the hands-on activities will help you understand science better?

Pre-test



Post-test

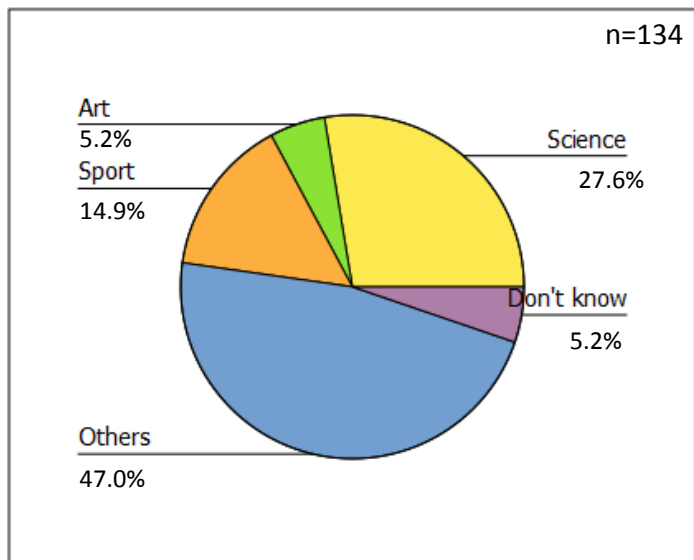


Statistic	Value	df	Asymp. Sig. (2-tailed)
Pearson Chi-Square	9.60	4	.048
Likelihood Ratio	9.77	4	.045
Linear-by-Linear Association	2.63	1	.105
N of Valid Cases	258		

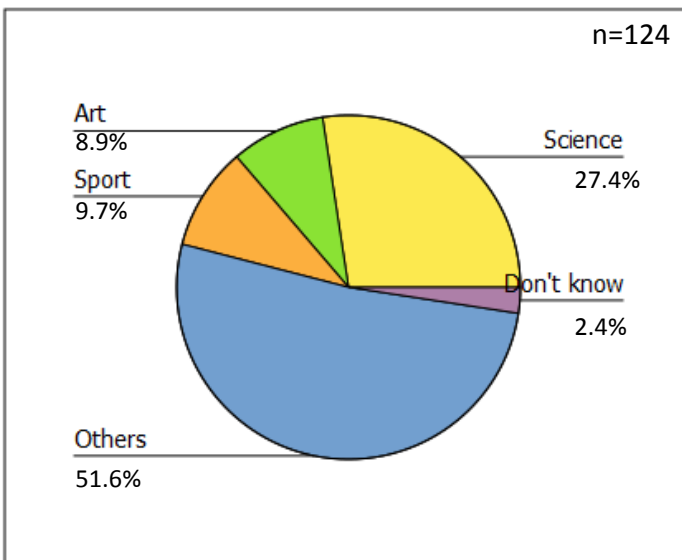
Students answered “Most likely” increased by 12.1%, while “Not sure” decreased by 12.5%. Statistically significant.

# When you grow up, what do you want to do? (A real job)

Pre-test



Post-test

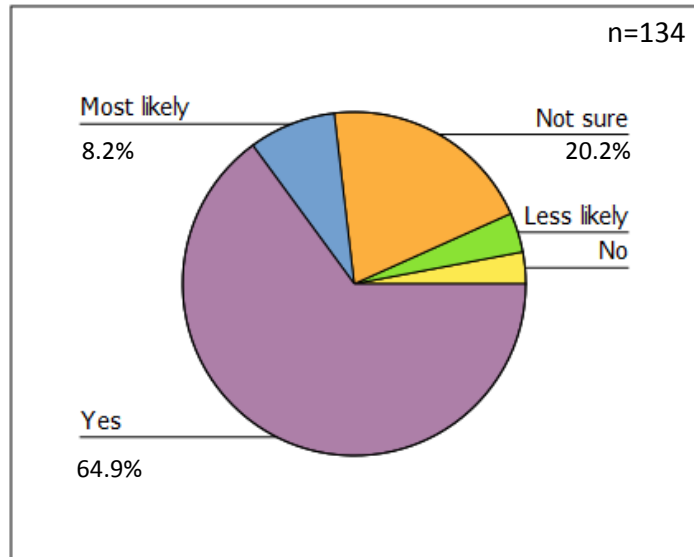


Chi-square tests.			
Statistic	Value	df	Asymp. Sig. (2-tailed)
Pearson Chi-Square	4.24	4	.374
Likelihood Ratio	4.31	4	.366
Linear-by-Linear Association	.06	1	.799
N of Valid Cases	258		

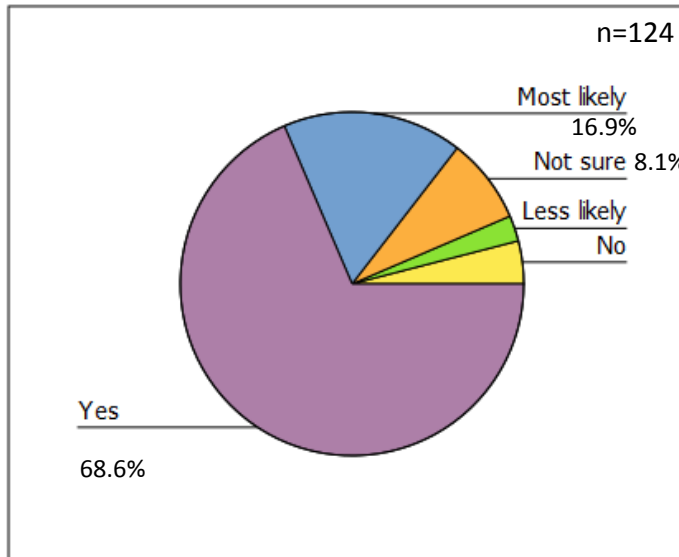
Students answers were similar before and after. No statistical difference.

## Would you like your school to spend more time on teaching science through hands-on activities?

Pre-test



Post-test



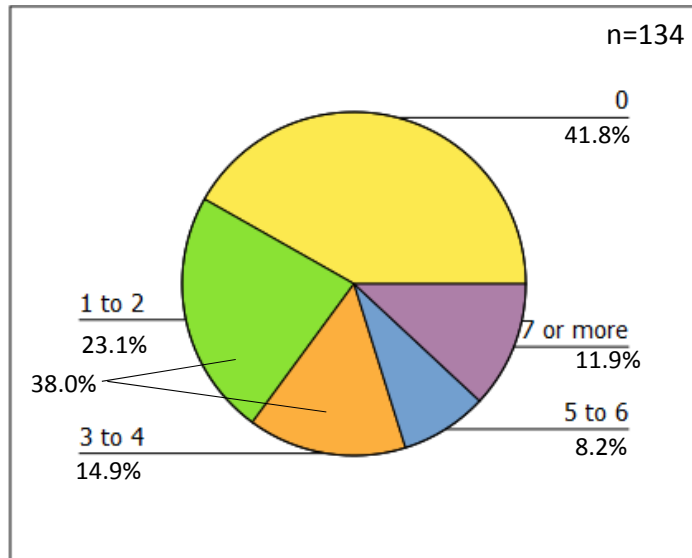
Statistic	Value	df	Asymp. Sig. (2-tailed)
Pearson Chi-Square	11.20	4	.024
Likelihood Ratio	11.54	4	.021
Linear-by-Linear Association	1.32	1	.250
N of Valid Cases	258		

Students answered “Most likely” increased by 8.7%, while “Not sure” decreased by 16.1%. Difference is statistically significant.

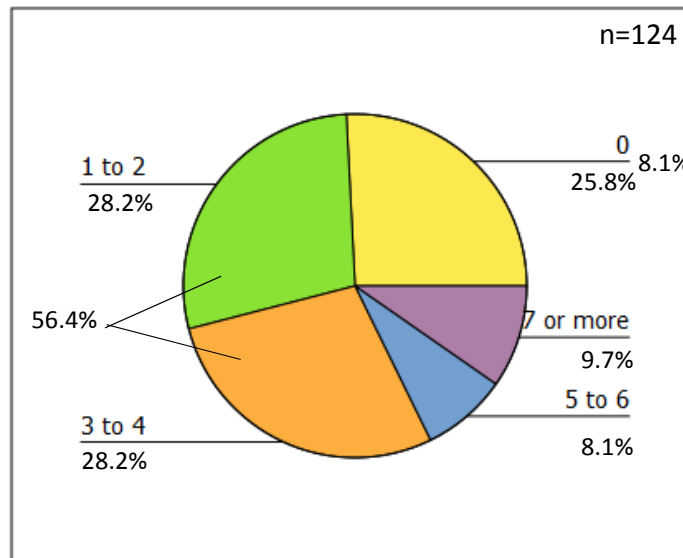


## How many science-related books do you read a week?

Pre-test



Post-test

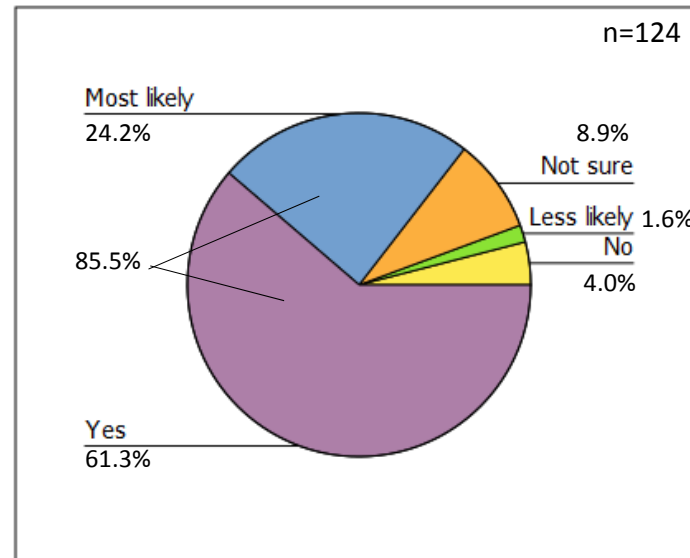


Chi-square tests.			
Statistic	Value	df	Asymp. Sig. (2-tailed)
Pearson Chi-Square	11.13	4	.025
Likelihood Ratio	11.25	4	.024
Linear-by-Linear Association	1.83	1	.176
N of Valid Cases	258		

Students read more science-related books after SO Kit. “0” category decreased 16%; “1 to 2” and “3 to 4” categories increased 18.4%. Statistically significant.

## Does Science Olympiad Kit get you interested in knowing more about science-related subjects?

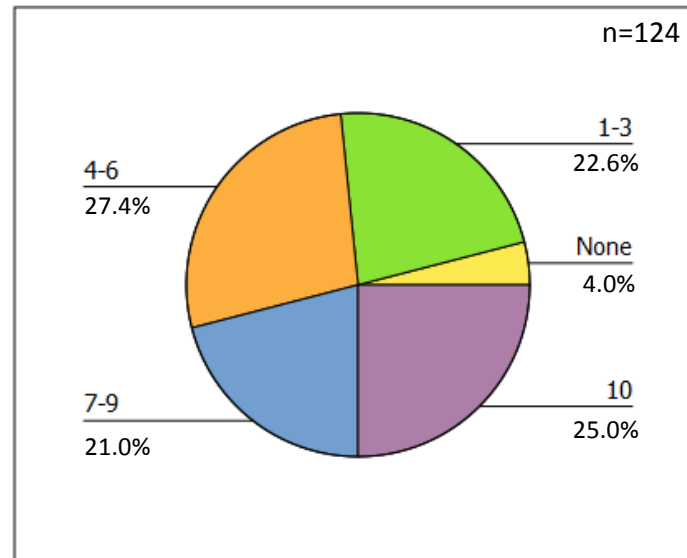
Post-test



Majority of students answered “Most likely” and “Yes” (85.5%).

# How many activities in the Science Olympiad Kit do you like?

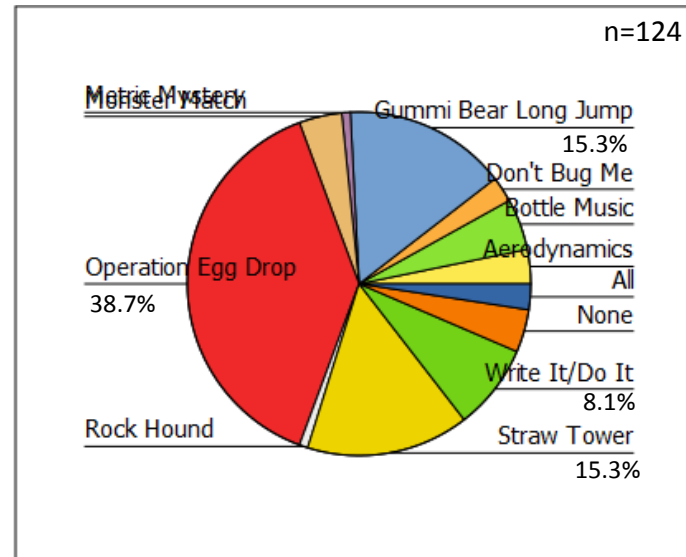
Post-test



Majority likes more than 4 activities (73.4%). 25% students like all.

# Which activity in the Science Olympiad Kit is your MOST favorite?

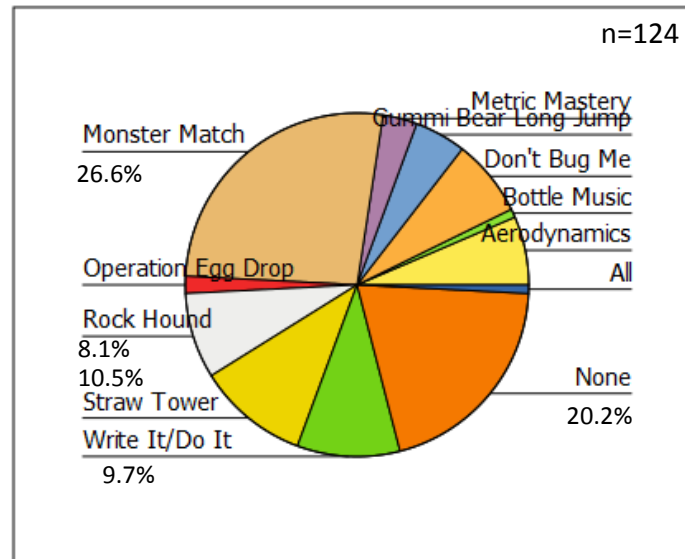
Post-test



Egg Drop is the most popular, followed by Straw Tower.

# Which activity in the Science Olympiad Kit is your LEAST favorite?

Post-test



Monster Match is the least popular. 20.2% of students do not dislike any of the activities.

## Conclusion

- The introduction of SO Kit has the following positive effects on the 3<sup>rd</sup> grade students:
  - They think that the hands-on activities will help them understand science better (p=0.048)
  - They would like their schools to spend more time on teaching science through hands-on activities (p=0.024)
  - They read more science-related books a week (p=0.025)
- Accept the alternative hypothesis:  
*H1: Science Olympiad Kit increases the interest of 3<sup>rd</sup> grade students in science*

## Strengths

- Provided demographic information and interest levels in science to the educators and DSO Board members
  - Investigated if the activities in the Science Olympiad Kit would get the third graders more interested in science
  - Reflected the thoughts of the third graders towards the Science Olympiad Kit
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## Limitations

- Three schools started introducing the activities in the Science Olympiad Kit at different times (Sept, Nov, Dec).
  - Three different teachers administered the introduction of Science Olympiad Kit in their own ways and the frequencies are not the same. The current study does not investigate these factors.
  - The number of schools and the number of students are relatively small. This research may not generalize to all the third graders in Delaware. It can be viewed as a reference.
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## Acknowledgement

- Clint Moore, Administrator, Epworth Christian School
  - Kristin Becker, T.A.G./Enrichment teacher, North Star Elementary School
  - Kimberly de Jongh, Special Education, Forest Oak Elementary School
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THANK YOU.

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