

Exploring Physics Surveys

Exploring Physics is an extra curricular program that focuses on female students in grades 5-7. The program runs for four weeks, with two 90 minute sessions per week. Units are available in Optics, Electricity, Sound and Mechanics, with different units for grades 5 and for 6-7. Students perform hands-on activities related to physics concepts, and complete about 20 activities in the four week period. The program concludes with a family night.

Exploring Physics is part of a program entitled *Promoting Young Women in the Physical Sciences*, funded by the National Science Foundation through grant number NSF-HRD 96-19140; M. Chandrasekhar, U. of Missouri Columbia, and R. Litherland, Columbia Public Schools, Directors.

The surveys included are the following:

| | |
|--|---------------|
| Science Experience Survey | pages 2 and 3 |
| Student confidence survey pre / post | pages 4 and 5 |
| Student interest survey, pre / post | pages 6 and 7 |
| Student evaluation survey (end of program) | page 8 |
| Family Night Evaluation | page 9 |

(Note: The pages are not numbered, however this scheme will allow you to print selected pages, if desired)

Exploring Physics Science Experience Survey

Name _____

Circle the word that best describes how often you have done the activities listed in the survey.
Do NOT include activities that were required as a class assignment

1. I have used LEGO equipment.

- A) a lot B) sometimes C) once or twice D) never

2. I have visited a natural history or science-center museum or a nature center.

- A) a lot B) sometimes C) once or twice D) never

3. I have taken a tour of a hospital, medical, or dental facility.

- A) a lot B) sometimes C) once or twice D) never

4. I have taken something apart to see how it works.

- A) a lot B) sometimes C) once or twice D) never

5. I have watched science programs on television (for example 3-2-1 Contact, NOVA, Nature, National Geographic, Discover).

- A) a lot B) sometimes C) once or twice D) never

6. I have performed a chemical experiment or used a chemistry set.

- A) a lot B) sometimes C) once or twice D) never

7. I have looked through a telescope at the night sky.

- A) a lot B) sometimes C) once or twice D) never

8. I have read books about science or scientists.

- A) a lot B) sometimes C) once or twice D) never

9. I have fixed something mechanical (for example, a bicycle).

- A) a lot B) sometimes C) once or twice D) never


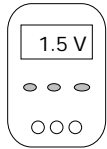
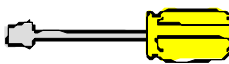


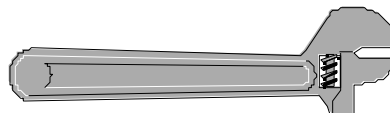
10. I have fixed something electrical.

- A) a lot B) sometimes C) once or twice D) never

This survey is modified from the 40 item survey of Mason, C. L., & Kahle, J. B. (1988). Student attitudes toward science and science related careers: A program designed to promote a stimulating gender-free learning environment. Journal of Research in Science Teaching, 26(1), 25-39. The survey is used for students participating in Exploring Physics, an extra curricular program for 5-7 grade female students. The Academy is a part of an NSF funded program entitled Promoting Young Women in the Physical Sciences, M. Chandrasekhar and R. Litherland, University of Missouri Columbia, Directors.

11. I have worked with science-related hobbies.
 A) a lot B) sometimes C) once or twice D) never
12. I have helped someone work on a car (for example, changing the oil, adding water to the radiator).
 A) a lot B) sometimes C) once or twice D) never
13. I have made model rockets, cars, or airplanes.
 A) a lot B) sometimes C) once or twice D) never
14. I have read science articles in newspapers or magazines.
 A) a lot B) sometimes C) once or twice D) never
15. I have talked about science topics with my friends.
 A) a lot B) sometimes C) once or twice D) never
16. I have worked on science projects (for example 4-H fair, Brownie or Girl Scout project).
 A) a lot B) sometimes C) once or twice D) never
17. I have visited a planetarium or aquarium.
 A) a lot B) sometimes C) once or twice D) never

Place a check mark beside those items that your parent or other adult at home has showed you how to use.

| | | | |
|-------------------|---|-----------------|---|
| _____ hammer |  | _____ voltmeter |  |
| _____ screwdriver |  | _____ drill |  |
| _____ pliers |  | _____ wrench |  |

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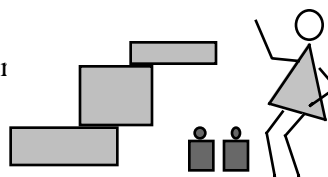
Exploring Physics

Confidence Pre and Post-Evaluation

First and Last Names _____

For each of the following problems, indicate your confidence in being able to correctly solve it by circling a number on the scale from 1-9, with 9 being very confident. REMEMBER, you do not have to solve these problems; just rate your confidence in being able to solve them.

1. You are given blocks and weights and asked to build a tower like the one in the picture. Do you think you could put the weights in the right place to make the tower balance?



Weights

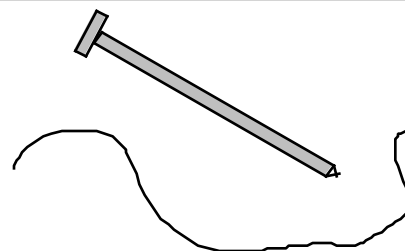
| | | | | | | | | |
|-------------------|---|----------------------|---|---|-----------------|---|---|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| No way! | | Maybe I could do it. | | | I'm pretty sure | | | Yes! I'm sure |
| I couldn't do it. | | | | | I could do it. | | | I could do it. |

2. Three bulbs of the same kind are connected in a circuit. Two are dim and one is bright. Do you think that you could correctly build this circuit?



| | | | | | | | | |
|-------------------|---|----------------------|---|---|-----------------|---|---|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| No way! | | Maybe I could do it. | | | I'm pretty sure | | | Yes! I'm sure |
| I couldn't do it. | | | | | I could do it. | | | I could do it. |

3. Do you think that you could make a nail into a magnet?

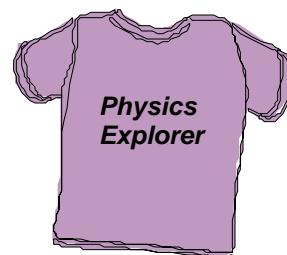


| | | | | | | | | |
|-------------------|---|----------------------|---|---|-----------------|---|---|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
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4. You are at the mall and see your friend. A yellow light is shining on your friend's shirt so that it looks red. Do you think that you could figure out the actual color of the shirt?



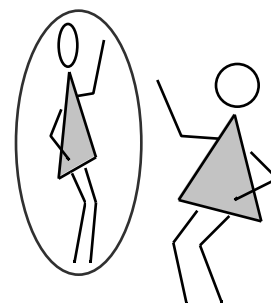
| | | | | | | | | |
|-------------------|---|----------------------|---|---|-----------------|---|---|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| No way! | | Maybe I could do it. | | | I'm pretty sure | | | Yes! I'm sure |
| I couldn't do it. | | | | | I could do it. | | | I could do it. |

5. Your flashlight suddenly goes dead. You don't know if it is the battery, bulb, switch, or the connections. Do you think that you can figure out what is probably wrong with your flashlight?



| | | | | | | | | |
|-------------------|---|----------------------|---|---|-----------------|---|---|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| No way! | | Maybe I could do it. | | | I'm pretty sure | | | Yes! I'm sure |
| I couldn't do it. | | | | | I could do it. | | | I could do it. |

6. You stand in front of the mirror at the mall that makes you look very tall and thin. Do you think that you could describe to your friend how the mirror makes you look like this?



| | | | | | | | | |
|-------------------|---|----------------------|---|---|-----------------|---|---|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
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Exploring Physics Interest Pre / Post Evaluation

First and Last Names _____

For each of the questions, circle the number from 1-9 that indicates how interested you are in the following activities, with 1 being the most interested.

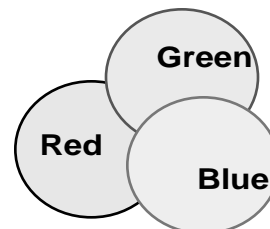
How interested would you be in.....

1. Making a submarine float and sink?



| | | | | | | | | |
|--------------------------|---|-----------------------------------|---|---|------------------------------------|---|---|--------------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| I would love to do this! | | This would be pretty interesting. | | | I might like to try this sometime. | | | I would never want to do this. |

2. adding and subtracting colors to make new colors?



| | | | | | | | | |
|--------------------------|---|-----------------------------------|---|---|------------------------------------|---|---|--------------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
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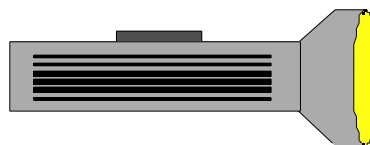
3. using wires, batteries, and bulbs to wire electrical circuits in a toy house?



| | | | | | | | | |
|--------------------------|---|-----------------------------------|---|---|------------------------------------|---|---|--------------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
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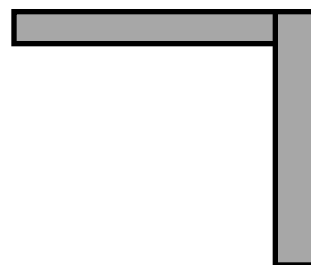
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4. building your own flashlight?



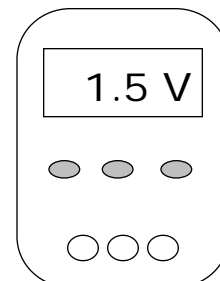
| | | | | | | | | |
|--------------------------------|---|-----------------------------------|---|---|------------------------------------|---|--------------------------|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| I would love to do this! this. | | This would be pretty interesting. | | | I might like to try this sometime. | | I would never want to do | |

5. finding ways to make a beam of light go around corners?



| | | | | | | | | |
|--------------------------|---|-----------------------------------|---|---|------------------------------------|---|--------------------------------|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| I would love to do this! | | This would be pretty interesting. | | | I might like to try this sometime. | | I would never want to do this. | |

6. using a voltmeter to check the voltage of a battery?



| | | | | | | | | |
|--------------------------|---|-----------------------------------|---|---|------------------------------------|---|--------------------------------|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| I would love to do this! | | This would be pretty interesting. | | | I might like to try this sometime. | | I would never want to do this. | |

Exploring Physics Student Evaluation
Electricity & Magnetism
Smithton Middle School
April 1998

First and Last Names: _____

Directions: We are interested in improving this program. Please complete the form and give it to your teacher. Circle the place on the lines that represents your reaction to each statement regarding the Exploring Physics Program.

Have you ever participated in Exploring Physics before? YES NO

1. The Exploring Physics Program was

a. 1 _____ 2 _____ 3 _____ 4 _____
Done very well _____ *Done poorly*

b. 1 _____ 2 _____ 3 _____ 4 _____
Easy _____ *Hard*

c. 1 _____ 2 _____ 3 _____ 4 _____
Exciting _____ *Boring*

d. 1 _____ 2 _____ 3 _____ 4 _____
Unnecessary _____ *Needed*

e. 1 _____ 2 _____ 3 _____ 4 _____
Dull _____ *Interesting*

f. 1 _____ 2 _____ 3 _____ 4 _____
Complicated _____ *Simple*

2. What are three things you learned from these activities?

- 1.
- 2.
- 3.

3. What were your favorite activities?

4. What were your least favorite activities?

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Family Evaluation Exit Slip

Thank you for taking the time to attend Family Night for *Exploring Physics Program*. As you may already know, this program is funded by the National Science Foundation's Experimental Projects for Women and Girls program, and is meant to motivate the interest of girls in science.

As part of our evaluation, we would appreciate your comments on the program, Family Night, and your daughter's reaction to the program.

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