



## SCIENCE OUTREACH AND RECRUITMENT

### *What is Girls SOAR?*

Girls SOAR is a program for girls ages 11-14, designed to encourage girls to explore science and math.

### *What is SOAR's goal?*

Girls SOAR aims to encourage girls to explore science and math, develop confidence in their mathematical and scientific abilities, and give girls a new image of who can be a scientist and what a scientist can do.

### *Why do we need SOAR?*

Although there has been an increase in the number of women in scientific careers over the past forty years, particularly in medicine and biology, there is still an overall disparity in the percentage of women in science and engineering, especially compared to other professions such as business and law. Women currently in these fields can continue the work done by our predecessors by reaching out to a new generation of girls, get them interested in science and math and instill in them a sense of confidence in their abilities.

### *Why girls in middle school?*

Studies show that there is a significant drop in the number of girls who say they are interested in science and math and are confident in their abilities between elementary school and high school. By working with middle school age girls we aim to encourage girls to continue their interest in science and math during a time when girls become intimidated or bored by science and math.

### *Why do girls need a new image of who a scientist is?*

Ask a girl, or even an adult, to describe what a scientist looks like and overwhelmingly you will get the following answer:

*A scientist is a white man with glasses, a lab coat, and a funny haircut. A scientist is a very smart man who is nerdy, geeky, and works in a lab all the time. A scientist has poor hygiene, lacks social grace, talks about things people do not understand, is balding, is overweight, has a beard, and is constantly grumpy.*

In short, a scientist is someone who is viewed as inaccessible, awkward, and male. This prevailing image of a scientist makes it difficult for girls to imagine themselves as a scientist. By providing as mentors, young women who are scientists, we can present a new idea of who can be a scientist.

## Girls SOAR: Plan of Action

**Cool Science Projects (CSPs)** are a fundamental part of the Girls SOAR program. Each girl may choose which science project she wants to work on. Each scientific discipline (biology, chemistry, physics, and engineering) has its own project. Each project should, ideally, provide each girl with a final product they can show others and take home with them to foster a sense of confidence in girls about their abilities and work. Counselors will be responsible for planning their own project but Girls SOAR will provide all needed materials.

**Miniature Presentations (MiniPs):** Public speaking and communication skills are important parts of being an effective scientist. Often, girls in the classroom have trouble speaking up, asking questions, and taking pride in their work. MiniPs are designed to help give girls practice at explaining their work to others and gaining confidence in showing others what they have accomplished.

**Counselors** are the leaders, organizers, and mentors of Girls SOAR. They act as role models for the girls and should be encouraging, engaging, and approachable. Each scientific discipline will have two counselors who are responsible for planning the CSP and teaching their team about the fundamental scientific principles used in the project.

**Enrollment:** Girls SOAR is a free program to any girl aged 12-14. It is important the enrollment remain free to open this explorative opportunity to girls of all economic backgrounds. To interest girls, we plan to ask math and science teachers in local schools to nominate students who they feel would be interested and benefit from the program. An enrollment of 20-30 girls is ideal, allowing new girls to enroll in between the 3-week and 6-week programs.

### Long Term Plan

Girls SOAR proposes to be a year long program, with a 3 week warm up in the fall, an extended 6 week program in the winter, and a week long day camp in the summer.

### 3 Week Warm Up

A program that meets for 3 hours either on a weekday afternoon or Saturday morning with an enrollment of 20-30 girls and 12-15 mentors. The goal of this program is to introduce girls to how fun and interesting science can be. Our hope is that after this 3 week program girls will become excited about science and sign up for the next session.

*Week One: Who is a scientist?*

- ***Who is a scientist?***
- ***What does a scientist do?***
- ***Pick your CSP!***

**Icebreaker: *Nice to Know You!***

In order for the girls to get to know each other and the counselors, and also to help girls become comfortable with public speaking, we start with an icebreaker game.

**Activity: *Draw-a-Scientist***

Girls will be given paper and drawing supplies and be asked to draw a scientist. Drawings are then collected and we make a list of all the common traits in a scientist from the drawings.

**Counselor Presentation:** *Meet a Scientist*

The counselors give a short presentation of who scientists are and can be, highlighting famous women in science.

**Activity:** *A Scientist does...*

Girls are broken up into groups and are asked to make a list of jobs a scientist can do. One their lists are compiled, everyone joins together to compare lists. The group with the longest list will win a prize.

**Counselor Presentation:** *A Scientist can...*

The counselors give a short presentation about what jobs a scientist can have and how they affect our daily lives.

**Counselor Presentation:** *CSPs*

Each counselor pair gives a short presentation to the girls about their cool science project. Counselors should try to make their “pitch” as exciting as possible, as they are trying to recruit people to their project.

*Week Two: CSPs*

**Icebreaker:** Again, girls and counselors will begin with a game that helps girls to get to know one other.

**CSPs:** Girls will break up into their CSP groups and counselors will show their teams their final product. Girls will be asked to brainstorm ideas of how to create the product they are shown. Once finished brainstorming, the counselors will take the girls through the scientific process (aim, hypothesis, method, etc.) and work together on their projects for the majority of the session.

**MiniP:** For the last half hour of the session, girls will be paired up and asked to draw an invention of their own choosing (homework robot, little brother repellent, etc.). Each pair will be asked to give a two-minute presentation, explaining their invention.

*Week Three: Show Off!*

**CSPs:** Girls will go straight into their CSP group to finish up their project and put together their final presentation. Counselors and girls should gather in a circle and play “pass a compliment”, going from girl to girl saying one thing each girl contributed to the project. In their final presentations each girl should be a chance to speak.

**Show Off:** All the groups will join together for their final presentations, each of which should be about 5-10 minutes long. Presentations will cover what their goal was, how they accomplished their, and what they feel good about in their final product.

**Party Party:** This week ends with a pizza party and science goody bags.

## 6 Week Exploration

The six week exploration program is similar to the three week warm up. SOAR will meet for 2 hours either on a weekday afternoon or Saturday morning. This program will

continue to use CSPs to engage girls in science. Instead of choosing one project however, girls will be divided into teams and rotate every two weeks to a new project. Teams can have themes between all three of their experiments or choose to do three completely unrelated projects. At the end of the rotation time, all the teams will get together and share what they have done.

MiniPs will take place every other week, again with girls working in pairs. MiniP activities can be:

1. Designing a maze
2. Paper Airplane Design
3. Design a habitat
4. Spin Art