

Standard Operating Procedure (SOP): Flipped Science Fair

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Description of the event:	Researchers present their research in the form of a poster to high school students, who are the judges and responsible for selecting top presenters.
Purpose:	To disseminate research findings to a lay audience, exposing high school students to new scientific areas/information and exciting them about research, while training researchers on how to present to a lay audience.
Length of the event:	1.5-2 hours plus setup/cleanup
Participants:	-High school students (2-3 per poster) -Researchers/Investigators
Resources needed:	Posters, poster boards and easels, and clips/thumb tacks, evaluation sheets, pens, poster prizes and awards, food/drinks, adequate space with good acoustics, a committee willing to provide feedback to investigators preparing posters

Detailed description of the event with practical notes

Introduction (20 minutes, in the location set aside for filling out evaluation surveys): A faculty or junior investigator should welcome the high school students when they arrive. This is a good opportunity to explain the research theme/focus of the posters they will see and who the poster presenters are. It is also a good time to emphasize the importance of being judges at the science fair: the fact that the high school students will help figure out who the most outstanding poster presenters are and will have the opportunity to present the awards to the investigators. Not to mention that events like these help scientists improve in explaining their research to a lay audience. Finally, the format of the event needs to be shared with the high school students, including giving them information on how to judge. First, it's a good idea to run through the evaluation sheet with them and tell them that it's important to be honest when providing feedback and it is completely OK to be critical and to not give the highest scores in the various categories. The place where the poster number needs to be written down on the evaluation sheet should be pointed out so the students remember to write down which poster they are judging. It is also important to emphasize that if they don't understand something during the presentation, they should ask about it, in fact, in general, they should feel free to ask questions related to the research. Finally, have students form groups of 2-3. Particularly if there are a lot of freshman, it may be worth coming up with a way to ensure that groups represent a good age/class distribution. One option is to give them colored notecards based on what grade they are in, then make sure that groups consist of both upper and lower classmen.

Poster session and judging (~1-1.5 hour, each student group sees 3 posters): Each group of students will hear about three different posters, with time after each poster to fill out their evaluation sheet. They will have 15-20 minutes to listen to an interact with each poster presenter. We recommend a 5-minute warning be given as a time check. After listening to a poster, students enter the area for the judges (which should be physically separate from the poster session), where each student fills out their evaluation sheet. There will be approximately 5-10 minutes given for this. We found that many groups engaged in conversations about the pros and cons of the presentation and details of the research. As students return to the poster session, they leave these evaluation sheets in a designated area, sorting based on poster number. We found that the easiest way to rotate students through posters was to have them start at one poster, then the next time see the poster with the subsequent poster number. High school students were free to go to the judging area after they were done talking with the poster presenters.

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Award Ceremony (15 minutes): Once students have seen their three posters, we had them average the total points on the judging sheets for each poster. Then, we selected high school volunteers who presented the award recipients with an award and a gift certificate.

Step-by-step preparation for the event (Steps with asterisks contain additional information below the table).

Step	Preparation	Time needed
1.	Contact a local high school interested in this opportunity for their students, if such a contact doesn't already exist.	<i>8-12 months prior to event date</i>
2.	Identify date of event	<i>3-6 months prior</i>
*3.	Book location of event	<i>3-6 months prior</i>
4.	Advertise among researchers and have them sign-up to participate	<i>2-4 months prior</i>
5.	Share FSF Poster Guide with those who signed-up	<i>2-4 months prior</i>
*6.	Coordinate with local high school(s) to ensure that roughly the correct number of high school students will attend	<i>2-4 months prior</i>
*7.	Identify committee of 3-4 people able to provide high-quality feedback on posters and poster presentations to investigators.	<i>2-3 months prior</i>
8.	Have investigators turn in preliminary draft of poster	<i>6-8 weeks prior</i>
9.	Return comments to participants	<i>5-7 weeks prior</i>
10.	If needed, second consultation on poster	<i>3-6 weeks prior</i>
*11.	Have investigators give a 10-minute practice talk presenting their poster, with prior feedback(s) incorporated, and receiving additional feedback on the presentation (and poster)	<i>2-3 weeks prior</i>
12.	Finalize evaluation sheets and any feedback form/survey you would like the high school students and/or graduate students to fill out	<i>Days to 1 week prior</i>

Step 3. Try to find a location that has good acoustics (doesn't get too loud when many people are talking at once) and where there are two separate spaces – one for the poster presentations and one for the high school students to fill out their evaluation sheets and, if desired, discuss the poster(s) within their group (we found this happened with many groups).

Step 6. Shoot for about 30% more students to sign-up than you would need. It's best to have a group of 2-3 students look at a poster together. Being in a group seems to give the high school students more confidence to ask questions and interact with the presenter and also encourages them to discuss the research more during the "judging" period.

Step 7. In addition to junior and senior investigators who have experience presenting to a lay audience, you may consider teaming up with one or more members of a student run organization that may be interested in science outreach or advocacy (e.g. at Yale, the very first Flipped Science Fair was organized by the Yale Science Diplomats and we worked with them to

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make our event a success) or others with experience in reporting on or making a film about science, technology or health.

Step 11. Presenters should aim to walk someone through their poster, without interruptions, in 10 minutes. Although we only required that people come for their 20-minute slot, several wanted to stay for the entire practice session, learning from comments on other presentations and/or providing comments

Check-list for day of event

check	item
	Evaluation sheets for high school students (3 per student)
	Poster boards and easels
	Thumb tacks or clips to attach posters to poster boards
	Pens for high school students to fill out evaluation sheets
	Poster award certificates
	Poster prizes
	Food and drinks ordered
	Numbers printed/notecards to number each of the posters (used in judging)
	Feedback forms/surveys (optional)
	Small "gift" for high school students or any other information you may want the students to have (optional)
	Colored notecards to identify grade level of students (optional)