

Summary of the R.L. Childers Midway Physics Day at the South Carolina State Fair, October 2011 (and previous years)

We followed our normal routine for organizing Midway Physics Day during these years. That involved sending out our Fair announcement in late April to school districts around the state, then sending another reminder in late August and opening up online registration in September. We assigned wristbands on a first-come first-serve basis with a limit of 120 per school. In 2008 we discontinued the practice of sending wristbands for chaperones. After the registration deadline closed, we went back and added wristbands to schools which requested more than 120 (if we have any left.) The wristbands were mailed out about ten days prior to the Fair.

Table 1 shows the number of schools and the number of student wristbands requested for each year in the period 2008-2011. Often, schools will show up with a few more, or a few less students than they received wristbands. We redistributed the bands to schools that need them. Prior to 2009 we were usually left with very few unused bands. In 2009 and 2010 the total number of reservations were down, and in addition (especially 2010) we had a number of cancellations (of large schools) at the last minute. Many of those schools offered budget woes as the explanation for their cancellations. The 2011 demand seems to have come back up to the level that we were seeing in 2008 and prior years.

In 2011 we had requests from 63 schools representing 3436 students. We had three schools cancel at the last minute, but we were able to redistribute their ~300 tickets. We were unable to fulfill the requests from 10 schools, representing about 600 students.

Table 1. Wristband requests for 2008-2010.

Year	Number of Schools	Number of Student wristbands requested	Wristbands unused
2008	61	3143	5
2009	58	2476	~220
2010	56	2503	259
2011	49	3436	20

We request that school groups come to our tent and check in after arriving at the Fair. While teachers are checking in, the students can visit the many hands-on demonstrations that we have set up around the tent. In previous years (2008 and earlier) we had been doing a stage show, but we noticed that the students were not as engaged as we would like them to be and we added some roving demos to the mix. We decided in 2009 to do away with the show altogether and make all activities “active.” We noticed in 2010 and 2011 that many students had class assignments that involved describing the physics principles behind demos of their choice. The students have about an hour to experience these demos before they move on to the rest of the Fair when the rides start at 11:00 am.

The primary purpose of Physics Mentors at the Fair is to get the students involved in the physics of the Fair. We typically have twenty Mentors at the Fair with a mixture of faculty, students and staff. The Mentors run the demos during the pre-ride time and, once the rides start, they disperse to a few key locations near rides that we deem to have important physics principles behind them. We have PASCO Data Explorer probeware that allows the students to bring accelerometers on the rides with them (in fannypacks), which we display on laptops for them immediately after they get off the ride. We make the data available for download after the Fair. Many schools also bring their own data collection tools.

In order to better ascertain how the teachers used the Fair in their classrooms, we asked participating schools to complete a survey form dealing with their use of the Fair experience in their teaching. Forty-six schools returned the most recent survey in 2011 (94%), compared to 63% returning surveys last year. The summary of the 2011 survey is shown in Table 2 below and a copy of the actual survey form is included at the end.

We asked the teachers to check every box that applied to their class or school, so the individual categories do not sum to 100%. The results are shown for each question separately as a percent of the total number of schools returning survey forms, as well as a summary for each category.

What we can infer from the survey:

- All of the schools participating used the Fair experience to teach the subject. A significant fraction (~70%) used the Fair as part of a directly graded assignment.
- Most of the schools (83%) brought physics classes.
- Almost all (98%) of the responding schools analyzed data from the Fair rides.
- About 90% of the schools made use of our resources (lesson plans, ride explanations, etc.) to prepare for their Fair activities.

We believe that this is a strong indication that the attending schools are using the Midway Physics Day experience as an educational tool to enhance their instruction of physics in the classroom.

Table 2. Summary of survey responses from schools attending the 2011 Midway Physics Day at the Fair

Category summary	Fraction responding to each question	Survey Questions
		Type of class
Attended with a Physics class 83%	22%	AP Physics
	43%	Honors Physics
	54%	General Physics
	17%	General Science
	24%	Other
		Use in the classroom
Classroom Use of Fair activities 100%	70%	Midway Physics is used as part of a graded project.
	76%	Students complete worksheets (or homework) based on Midway Physics activities.
	72%	Examples from Midway Physics are used in classroom lessons.
	33%	Examples from Midway Physics are used on exams.
		Use of Data from the Fair
Use of Fair Data 98%	85%	We will take data at the Fair.
	65%	We will analyze data that we take at the Fair.
	30%	We will analyze other ride data (that someone else took.)
		Resource Usage
Use of our resources 91%	57%	We used equipment, and/or activities, discussed on the Midway Physics resource web page.
	72%	We used the resource web page to help understand the principles of "Fair" physics.
	26%	Used some other resource to prepare for the Fair.

School _____

Teacher _____

Questions about the 2010 R.L. Childers Midway Physics Day at the SC State Fair

1. How many tickets did we send you?
2. How many **student** tickets did you purchase?
3. Do you plan to come to the fair next year?

Using Midway Physics day in your curriculum

This form covers the activities of the following type of class:

- AP Physics
- Honors Physics
- General Physics
- General Science
- Other, _____

Please check all that apply for the following questions:

- Midway Physics is used as part of a graded project.
- Students complete worksheets (or homework) based on Midway Physics activities.
- Examples from Midway Physics are used in classroom lessons.
- Examples from Midway Physics are used on exams.

Midway Physics is experienced

- before
- during
- after

the classroom unit that covers the related material.

- We do not do a classroom unit that specifically covers Midway Physics material.

Use of data, check all that apply:

- We will take data at the Fair.
- We will analyze data that we take at the Fair.
- We will analyze other ride data (that someone else took.)

Use of Midway Physics Day Resources, check all that apply

- We used equipment, and/or activities, discussed on the Midway Physics resource web page.
- We used the resource web page to help understand the principles of "Fair" physics.
- We used some other resource to prepare for the Fair. Please describe:

- We did not need extra resources to prepare for our Midway Physics experience.

If you have additional comments on any aspect of the Midway Physics Day experience, please put them on the back of this sheet, or include a separate letter.