



**Evaluation Procedures**

The evaluation of the second year of this NSF-sponsored camp utilized a mixed-method approach, with the following in mind as the ultimate aims of the project: 1) precipitating needed change, and 2) contributing to informed decision-making.

The following questions, aligned with the project goals, guided the development of all assessment measures:

- 1) Have the camp curriculum and the instructors’ methods instilled in student participants an understanding and appreciation of women as leaders in science? How has this impacted the students?
- 2) Have the activities of the grant served to increase students’ confidence and skills? What is their long-term effect? Have they impacted students’ career plans guiding them toward science, particularly computer science?
- 3) Has the establishment of a learning community been effective in meeting the other project goals?
- 4) Has the project leadership disseminated the results of the project effectively through both traditional and innovative means?

The Student Pre-/Post-Camp Survey (Appendix I) was designed in alignment with the grant goals and specifically refined to provide data on achievement of the curriculum objectives during the four week-long modules.

Data has been gathered both quantitatively and qualitatively; the pre-/post-camp surveys provided numerical data on changes as a result of the camp as reported separately by students and their parents. Online ‘Two Minute Papers’ were used daily to assess the students’ perspectives of the strengths of each day’s lessons and instruction as well as any issues, lack of clarity, or recommendations. The ‘Two Minute Papers’, along with pre- and post-survey open-ended questions and a student follow-up longitudinal study all provide a qualitative view of the interaction between the learners, instructors, and contexts, as well as the long-term impact of the experience. Instructors used formative assessments during the week to gauge participants’ understanding of content. This annual evaluation report is based on the following data collection protocols:

Students:	Parents:
Pre-Camp Survey Post-Camp Survey (at end of camp) Follow-up Reunion Survey (6 months later) Two-Minute Papers (daily during camp) Field Trip Evaluation	Post-Camp Survey

## **Student Pre- and Post-Camp Survey results**

The pre- and post-camp surveys consisted of identical items (Appendix I); these were analyzed using a *t-Test* for comparison of means for each survey item, using a pre-established level of statistical significance ( $p < 0.05$ ).

### **Part I. Student Inventory**

None of the items in this section showed statistically significant changes from pre- to post-surveys.

### **Part II. Attitudes Toward Computers**

In this section, four items resulted in statistically significant changes in means from pre- to post-survey.

These two items had increased means (more agreement):

4. Most computer scientists are men. ( $p < 0.01$ )
16. I would like a job working with computers or technology. ( $p < 0.05$ )

These two items, which were worded in the negative, resulted in statistically significant decreases in means from pre- to post-survey (more disagreement):

2. People who have "computer jobs" sit in front of a computer screen all day. ( $p < 0.0001$ )
6. To get a computer job, you have to work really hard. ( $p < 0.01$ )

### **III. Career Goals**

None of the items in this section showed statistically significant changes from pre- to post-surveys.

### **IV. Parental Attitudes**

None of the items in this section resulted in statistically significant changes from pre- to post-survey.

### **V. Peer and Teacher Attitudes**

None of the items in this section resulted in statistically significant changes from pre- to post-survey.

### **VI. Computer Science Tasks**

Three items in this section resulted in statistically significant changes from pre- to post-survey. In these items there was a decreased mean (*less* agreement on post-survey than on pre-survey).

3. I am interested in providing technical help to the police to catch people who break into the internet. ( $p < 0.01$ )
7. I am interested in designing programs that doctors can use in hospitals to make sure patients get the right drugs. ( $p < 0.01$ )
9. I am interested in writing a computer simulation to study the effects of deforestation on animal habitats. ( $p < 0.05$ )

### **Discussion of Student Pre- and Post-Survey quantitative results:**

In Part II, it is curious that campers *increased* their perception that "most computer scientists are men", considering that the leadership of the camp, the staff, and nearly every speaker were all females; but they did learn this reality as part of their discussions of computer science as a career.

There was a statistically significant change in students' attitudes toward a possible career in computer science or technology so we can conclude that the camp lessons and activities had a positive impact on students' future plans.

In Part VI, items #3, #7, and #9 all produced statistically significant changes from pre- to post-survey. These items indicate that students had *less* interest in the specific examples of computer science applications (providing technical help to police, designing programs for doctors, writing computer simulations). However, we know from the qualitative analysis of Attitudes Toward Computers (Q #1), which follows – that these students have learned that a computer scientist *does not* work on just one type of program, application, or activity. As a result of G2CS camp, they have developed an understanding that computer scientists generally work on many types of applications, travel to meetings, and collaborate in teams rather than work in isolation on a single task.

**Qualitative Analysis of Attitudes Toward Computers, Question # 1**

Question #1 asked students to “Describe what you think a typical computer scientist does at work each day”. This was a free-response format which allowed for a variety of answers. These have been summarized in the table below, indicating the number of responses in each category by pre- and post-survey. (The order is based on Pre-Survey frequencies.)

**Table 1: Attitudes Toward Computers Q#1: “What a typical computer scientist does at work each day”**

Categories	Pre-Survey Results	Post-Survey Results
Write computer programs/software/code	11	15
Improve efficiency of computers/chips	8	3
Study/design/build computers; hardware	4	7
Problem-solving	4	6
Explore/create new technology	4	3
Fix computers	3	0
Research, gathering information, and data analysis	2	2
There is no such thing as a ‘typical’ computer scientist	1	12
Work on links between software and computer	1	3
Improve lives and productivity	1	2
Graphics and presentation software	1	2
Make computer chips	1	0
“I don’t know”	1	0
Gets rid of viruses	1	0
Work in teams; have meetings	0	18
They could do anything.	0	7

**Discussion:**

There were major differences between the responses from the student pre- and post-surveys. In the post-survey, campers were emphatic that computer scientists *do not* sit in front of their computers all day; they work in teams, go to meetings, travel, make presentations and do many other things as well so that there is no such thing as a ‘typical’ computer scientist. White students often mentioned more than one function in the pre-survey, they were nearly twice as prolific with their answers in the post-survey, offering *many* varied activities for the work done by a computer scientist.

In the post-survey, none of the students listed ‘Fix computers’, ‘Make computer chips’, or ‘Gets rid of viruses’ as a computer scientist’s activity, although these were reported in the pre-survey. Also, none of them entered ‘I don’t know’ as a response. Rather than itemize ‘typical’ activities, seven suggested ‘They could do anything’. Clearly the students have a much broader, more complete understanding of the computer science profession as a result of the camp.

**Daily Two-Minute Evaluations**

At the end of each day of camp, students were asked to write a very brief evaluation of the day’s activities, using the following questions:

1. Describe what you liked best today.
2. Describe what you think we should have done differently.
3. Describe what you learned today that will be useful in your future.
4. Is there anything else you want us to know?

In addition, the campers were asked to rate the day on a 7-point scale:

1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far
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**Two-Minute Evaluation Results:**

*Every* day of camp resulted in a rating in excess of 5.0, between ‘Interesting’ and ‘Fantastic’. The mean rating for all days was 5.6, indicating an overall highly positive view of the camp, including the academic content, logistics, speakers, field trips, and all other aspects.

A compilation of *each* day’s responses is included in Appendix II. In general, the following statements summarize the responses over the four weeks of camp.

**Question 1. Describe what you liked best today.**

In nearly every instance among the 14 days’ evaluations, the greatest frequency on this question was in regard to the academic or content focus of the day. There were two exceptions: on the first day of camp, the greatest frequency was “Meeting everybody”, and one other day it was “Volleyball”. Students’ comments suggest that they were highly engaged and attentive to the academic content of each day’s sessions.

**Question 2. Describe what you think we should have done differently.**

The most prevalent answer to this question was “Nothing”, in 62% of the responses. The second most frequent response was “More time” – to work on robots, presentations, blogs, Alice, and social activities (kickball, making friendship bracelets). Occasionally, however, a camper would recommend ‘less time’ on these activities. There were other occasional comments, usually voiced by just one camper, about activities they would have liked to have done differently, that they needed clearer instructions, that they didn’t like the hot weather, or they would have preferred something different for lunch or snacks; none of these seemed like very strongly stated concerns or suggestions.

**Question 3. Describe what you learned today that will be useful in your future.**

The response with the highest frequency (29) focused on an activity which clarified the roles of Internet, HTML, networks, and routers. Two other responses with very high frequencies (28) were: “Alice: learning a computer language, how to do programming, animation” and “Programming robots”. Nearly every daily response to this question was related to the content focus of that given day, such as “I learned that sometimes programs don’t work and you have to try again and again.” A few other insightful responses were noted, however, such as: “Never give up”, “Follow your dreams”, “How to work as part of a team”, and comments on strategy such as “How to play Battleship well” and “Knowing my way around campus”.

**Question 4. Is there anything else you want us to know?**

The most common response was “No”, expressed 351 times over the course of the camp. Other responses to this question occasionally indicated a concern: “I lost my camera”, “I’m not a fan of cheese dip”, “I really don’t like kickball/soccer”. But far more often, this question elicited statements of enjoyment, excitement, and enthusiasm about the camp. Example responses include: “I love the camera”, “I love programming” and “I love this camp!” One student rated 7/6/12 as a “wonderfully amazing day!” Students reported “Today was fun!” 28 times.

**Quantitative Analysis of Week’s Instruction**

For the lessons during one of the weeks, the following objectives were established and used to develop a pre- and post-assessment (Appendix VIII).

Objective 1: Participants will understand the concept of markup and how web pages are marked up to display headings, bold text, emphasized text, and special characters.

Objective 2: Participants will understand how information (images, text, emails, web pages) is sent through the Internet. They will understand the concepts of routers, networks, packets, and addresses.

Objective 3: Participants will understand that there are various ways of searching data (linear, binary, hashing).

In spite of the instruction focused on these objectives, there was no statistically significant change between the pre- and post-assessments. However, as the instructor pointed out, there were only 1.5 days of instruction that week due to field trips and the overnight trip to Seattle, so any major leaps in knowledge should not have been expected.

## Parent Survey Results

At the closing banquet following the 2012 camp, parents were asked to complete a survey regarding their daughters' experiences. The following tables summarize those results.

**Table 2: Parents Survey Question # 1**

<b>#1. What do you think was the most valuable aspect of the camp for your daughter?</b>	<b>Survey Results N = 46</b>
Developing confidence, self-esteem and independence	20
Observing people at work (field trips) and gaining career information	18
Gaining friendships and social skills	18
Increasing her knowledge and interest in Computer Science and technology	11
All the activities (Alice, robotics, etc.) and field trips	10
Developing a positive attitude toward a future STEM* career	7
Gaining an understanding that creativity and artistic skills can be combined with technology	3

\*Science/Technology/Engineering/Mathematics

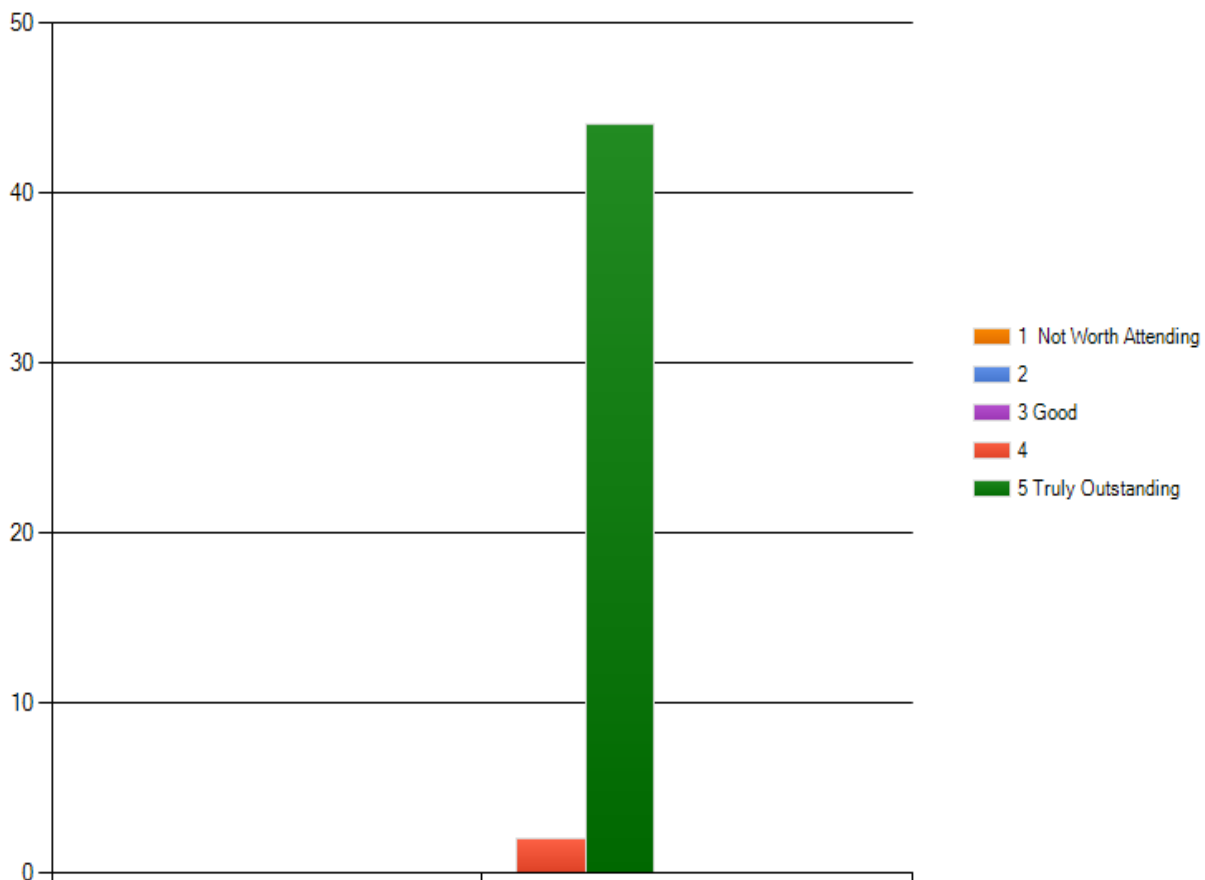
**Table 3: Parents Survey Question # 2**

<b>#2. Which activities, lessons or field trips do you think impressed your daughter the most?</b>	<b>Survey Results N = 46</b>
Seattle field trip/Intel/Microsoft/Radia Perlman/ U of W	43
Robotics	11
Visit to Flying Rhino	10
All of the hands-on activities	8
Alice	7
All field trips	7
OPB	6
Vernier/Segway	4
Amazon	4
Dissecting gadgets	3
3D printer activities	3

**Table 4: Parents Survey Question #3**

<b>#3. Please rate the G2CS camp compared to other summer opportunities your daughter has participated in.</b>					<b>Mean N = 46</b>
<b>1 Not Worth Attending</b>	<b>2</b>	<b>3 Good</b>	<b>4</b>	<b>5 Truly Outstanding</b>	<b>4.9</b>
0	0	0	2	44	

**Please rate the G2CS camp compared to other summer opportunities your daughter has participated in.**



**Table 5: Parents Survey Question # 4**

<b>#4. List at least three goals you have for your daughter as a result of camp.</b>	<b>Survey Results N = 46</b>
Continue learning (programming, robotics, STEM, computer science)	25
Work toward a STEM* career	19
Be whatever she wants to be; be happy; explore; take challenges; have fun	15
Maintain contact with camp friends	12
Continue to grow in confidence and self-esteem	10
Graduate from high school and college	7
Continue to develop problem-solving and communication skills	6

\*Science/Technology/Engineering/Mathematics

**Table 6: Parents Survey Question # 5**

<b>#5. Please share any other comments or concerns or recommendations you have for future camps.</b>	<b>Survey Results N = 46</b>
Everything was excellent and well-planned; amazing staff!	35
Good nutrition; excellent food	5
Hearing from and observing STEM* professionals was a great opportunity	4
Wish the camp had been longer	3
Make the Seattle field trip at least one more day	2
Riding the bus was an excellent experience	2
Is there any way to avoid the July 4 <sup>th</sup> week?	1
The girls need a 2 <sup>nd</sup> year of this camp as a follow-up	1
The letter of acceptance indicated a packet would be mailed (but wasn't)	1
Keep the website updated <i>during</i> the camp with photos.	1

\*Science/Technology/Engineering/Mathematics

**Discussion:**

Throughout the Parent Survey, the comments were extraordinarily positive. Following are some typical quotes from parents: “You will have a long-lasting impact on these girls.”; “This was by far the best camp she has ever attended.”; “My daughter was very sad for camp to come to an end.”; “I watched her gain confidence every day.”



## Field Trips

At the 2012 camp reunion, approximately six months following the end of the camp, students were asked to rate the eight field trips held the previous summer. The results follow.

Rate the field trips from 1 - 8. Let 1 represent your <i>favorite</i> field trip and 8 represent your <i>least favorite</i> field trip.								
	1	2	3	4	5	6	8	Mean
<b>Vernier</b>	0.0% (0)	14.3% (3)	19.0% (4)	0.0% (0)	<b>33.3%</b> <b>(7)</b>	4.8% (1)	9.5% (2)	4.9
<b>OPB</b>	0.0% (0)	4.5% (1)	18.2% (4)	22.7% (5)	9.1% (2)	<b>27.3%</b> <b>(6)</b>	13.6% (3)	5.0
<b>Intel</b>	0.0% (0)	9.1% (2)	<b>31.8%</b> <b>(7)</b>	9.1% (2)	4.5% (1)	9.1% (2)	13.6% (3)	5.0
<b>OMSI</b>	4.5% (1)	18.2% (4)	4.5% (1)	<b>27.3%</b> <b>(6)</b>	22.7% (5)	13.6% (3)	4.5% (1)	4.3
<b>Microsoft</b>	<b>81.8%</b> <b>(18)</b>	4.5% (1)	0.0% (0)	0.0% (0)	0.0% (0)	4.5% (1)	9.1% (2)	1.9
<b>Amazon</b>	0.0% (0)	4.8% (1)	14.3% (3)	9.5% (2)	14.3% (3)	<b>23.8%</b> <b>(5)</b>	19.0% (4)	5.6
<b>Flying Rhino</b>	13.6% (3)	<b>31.8%</b> <b>(7)</b>	9.1% (2)	9.1% (2)	13.6% (3)	0.0% (0)	9.1% (2)	3.8
<b>WebMD</b>	0.0% (0)	13.6% (3)	4.5% (1)	<b>22.7%</b> <b>(5)</b>	4.5% (1)	<b>22.7%</b> <b>(5)</b>	18.2% (4)	5.3

### **Discussion:**

As indicated earlier, the field trips were a very popular and inspiring component of the month-long camp. (At one point during the Vernier field trip, it appeared that every girl was going to apply for a future internship there.) The Microsoft field trip was the most often selected as a favorite, but it was also part of the overnight trip to Seattle which may have been a significant influence. Trips to OMSI and Rlying Rhino were also rated very highly. There was no consistent 'least favorite' field trip; consequently we can conclude that all of the trips were of interest and value to the camp participants.

## Follow-up Reunion Surveys:

### **Student Post-Camp Survey –**

Approximately six months following the 2012 camp, the participants were surveyed electronically regarding their attitudes toward the camp, its content, and the overall experience with items based on the ISTE NETS standards for students (Appendix VI). Complete results from this survey may be found in Appendix IV.

Of the 24 quantitative items in the post-camp survey, these are the three items in which participants reported the **most** change as a result of the camp. (Frequency is reported for those rating the item either as "More than Before" or as "Much More than Before".)

Item	n= 39	Mean
21. I understand and use technology systems.	38	4.41
24. I transfer current knowledge to learning of new technologies.	34	4.36
19. I demonstrate personal responsibility for lifelong learning.	33	4.23

Of the quantitative items in the post-camp survey, these are the three items in which participants reported the **least** change as a result of the camp. For these items, a large number of campers indicated “No Change”. (Frequency is reported for those rating the item as “Less than Before”. None of the campers rated any of the items as “Much Less than Before”.)

Item	n= 39	Mean
4. I identify trends and forecast possibilities.	1	3.77
7. I develop cultural understanding and global awareness by engaging with learners of other cultures.	0	3.79
17. I advocate and practice safe, legal, and responsible use of information and technology.	0	3.79

Even though these three items had the lowest mean scores, all of the responses but one were either “No Change”, “More than Before” or “Much More than Before”.

The post-camp survey also contained three open-ended questions. Complete responses may be found in Appendix IV. The following summaries are compiled from the participants’ most frequent responses.

**25. Explain how your experience with G2CS has changed your understanding of women as leaders in science.**

It really helped open my eyes to all the new roles and possibilities there are for women in positions of leadership in science. I learned that there are more women as science leaders than I previously thought. I learned that women really do have a role in computer science and that they can contribute as much as men do. Our camp instructors were all women; they were awesome and well-respected. (These comments represent the nearly unanimous positive statements to this question; only one participant stated “It hasn’t really.”)

**26. How has your experience with G2CS affected your confidence in your ability to use technology?**

Being in the G2CS program has made me more familiar with technology, and I am much more confident with experimenting and solving problems on my own. The camp has improved my confidence in my ability to use technology because I now know so much more about how devices and computers work. Before, when I had problems with computers I asked other people for help. Now I’m the one my friends come to when they need help. (The positive comments about improving the participants’ confidence in using technology were unanimous.)

**27. Has your experience with G2CS had an effect on your future career plans? Please explain.**

Of the 39 respondents, 34 indicated that the camp had a positive effect on their career planning, either confirming that they wanted to pursue a career in the sciences, or initiating thoughts about a career in the STEM fields, particularly computer science. Three of the participants indicated they already had career plans in other fields before coming to camp and those goals have not changed although they appreciated the content of the camp. Two indicated that they were very unsure and undecided about their career plans.

**Discussion of Post-Camp Survey Results:**

The mean of all 24 quantitative items was 4.00 – “More than Before”. Since these items were based on the national technology standards for students (ISTE), the camp clearly served its purpose well in preparing students in the knowledge of and appropriate use of technology.

The results on the three open-ended questions demonstrated an outstanding positive influence on the camp participants – building confidence, understanding applications of technology, recognizing women as leaders in the STEM fields, and considering future careers in STEM fields, particularly computer science.

**Reunion Survey of 2011 Campers:**

Participants from the first year of G2CS camp (2011) were invited to attend the reunion dinner for the 2012 camp, 18 months after their own experience. Here are some of the campers’ responses:

Now I feel more confident and know more about the chances out there for girls. Also, I am much more interested in animation now; Alice!

The long term impacts are that it helped me in school classes.

I think this camp really made me interested in programming and all the computer classes I've taken/will take. I'm very certain I'm going into the computer science field.

I realized that there were so many programs open to me, and as a result, I have become so much more involved in computer science programs.

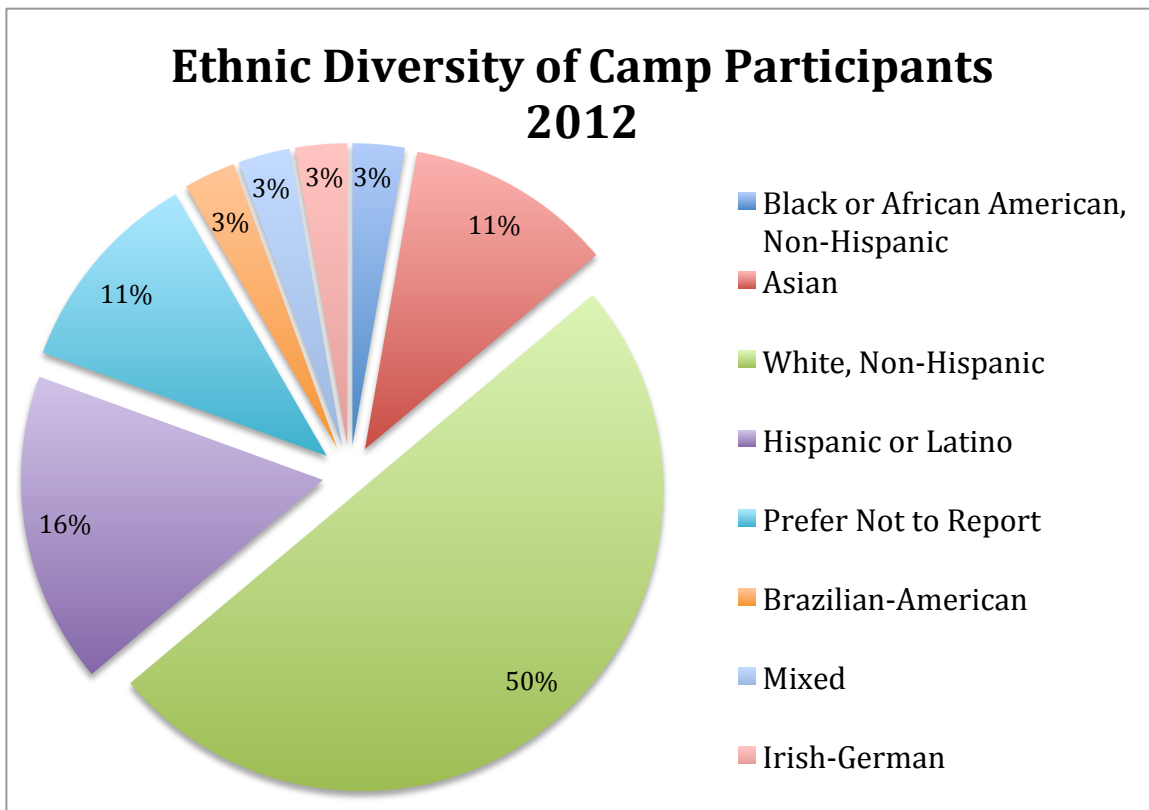
I saw a new possible career pathway for myself, one that I'm really interested in pursuing.

It definitely impacted whatever field I want to go into in the future.

## Other Findings:

### **Ethnic Diversity:**

In addition to attracting more girls to science, mathematics and computer science coursework and careers, another objective was to expand the number of girls coming from a variety of ethnicities to attend the camp. Conversations with tribal councils, unfortunately, did not result in girls attending from Native American reservations. Nevertheless, there was substantial diversity represented among the attendees. While Caucasian was reported most often (50.0%), 16.7% reported themselves as Hispanic, 11.1% as Asian, and 2.8% as Black; 4 students chose not to report, and 3 students selected 'Other'. (See Appendix III)



### **Teacher Self-Evaluation on ISTE Standards:**

Middle school and high school teachers were involved in the camp as both instructional assistants and as learners. A set of national standards for teachers in the use of technology in the classroom was used to guide the development of curriculum, with descriptors in five categories. (Appendix VII) The teachers self-evaluated their progress in each category based on their experience with the camp, using the following scale: 1 (Not at all) to 5 (A great deal). The results which follow indicate that the teachers felt they made a great deal of progress in understanding the concepts identified in these standards. Teacher B felt that she might have made more progress on these Standards but with field trips and a holiday, there were only 1½ actual lesson days. Each of the teachers

commented that besides learning more about implementing the standards, they found the week to be highly inspirational.

**Table 3: Teachers Self-Evaluation Results on ISTE Standards for Teachers**

ISTE Standards	Teacher A	Teacher B	Teacher C	Teacher D	Mean
1. Facilitate and Inspire Students' Learning and Creativity	4	3	4	4	3.75
2. Design and Develop Digital-Age Learning Experiences and Assessments	1	2	4	4	2.75
3. Model Digital-Age Work and Learning	3	4	5	4	4.00
4. Promote and Model Digital Citizenship and Responsibility	3	5	5	4	4.25
5. Engage in Professional Growth and Leadership	5	4	5	4	4.50

**Instructors' Self-Evaluation:**

The lessons were taught by a different instructor each of the four weeks of camp. These instructors were asked to evaluate their own planning and teaching based on the ISTE NETS Standards (Appendix VII). The results indicate that the instructors felt their curriculum addressed the Standards quite well, although they also commented that they didn't have many instructional days due to the number of field trips included in the camp.

**Table X: Instructors' Self-Evaluation Results on ISTE Standards for Teachers**

ISTE Standards	Instructor A	Instructor B	Instructor C	Instructor D	Mean
1. Facilitate and Inspire Students' Learning and Creativity	4	5	5	5	4.75
2. Design and Develop Digital-Age Learning Experiences and Assessments	5	5	4	3	4.25
3. Model Digital-Age Work and Learning	5	5	4	5	4.75
4. Promote and Model Digital Citizenship and Responsibility	5	4	5	1	3.75
5. Engage in Professional Growth and Leadership	5	5	4	3	4.25

## **Dissemination**

Dissemination about this project began almost immediately once the grant was approved and has continued throughout the second year of the project. A list of articles, posters, presentations, conferences, and news articles follows. In addition, the OPB staff filmed a series of interviews during the first year of camp and developed a 15-minute video; this was used as part of the orientation to the camp and is also posted on the G<sup>2</sup>CS website. They also did a series of interviews of female professionals in technology/computer science fields; these videos are also posted on the website.

### **Articles:**

Shereen Khoja, Camille Wainwright, Juliet Brosing, and Jeffrey Barlow. 2012. Changing girls' attitudes towards computer science. *Journal of Computing Sciences in College* 28: 1 (October 2012), 210-216.

Shereen Khoja, Juliet Brosing, Camille Wainwright, and Jeffrey Barlow. 2012. Girls gather for computer science (G2CS) (abstract only). In *Proceedings of the 43rd ACM technical symposium on Computer Science Education* (SIGCSE '12). ACM, New York, NY, USA, 665-665. *Journal of Computing Sciences in Colleges*. DOI=10.1145/2157136.2157366 <http://doi.acm.org/10.1145/2157136.2157366>

### **Posters:**

Shereen Khoja, Theresa Floyd. Presentation to the Pacific University Board of Trustees, Forest Grove, OR; May 17, 2012.

Juliet Brosing, Shereen Khoja. Presentation to the Oregon Technology in Education Network Annual Conference, Forest Grove, OR; September 15, 2012. ([http://commons.pacificu.edu/oten\\_conf/](http://commons.pacificu.edu/oten_conf/)).

Shereen Khoja, Theresa Floyd. Presentation to Microsoft Corporation, Seattle, WA; October 22, 2012.

### **Conferences/Presentations:**

Theresa Floyd, Shereen Khoja. "Girls Gather for Computer Science". Oregon Indian Education Association annual conference; April 2, 2012.

Juliet Brosing. Presentation to the Forest Grove Rotary Club: "Girls Gather for Computer Science"; September, 2012.

Shereen Khoja, Juliet Brosing, Camille Wainwright, and Jeffrey Barlow. Consortium for Computing Sciences in Colleges Annual Conference, Olympia, WA. October 5, 2012.

### **News Articles about G2CS:**

"Girls Gather for Computer Science" in *Pacific* magazine. <http://www.pacificu.edu/magazine/content/girls-only>

University of Washington newsletter (Dated 7/7):  
<http://seclab.cs.washington.edu/news.html>

Oregon Live (12/15): [http://blog.oregonlive.com/my-forest-grove/2012/08/year\\_two\\_of\\_pacific\\_university.html](http://blog.oregonlive.com/my-forest-grove/2012/08/year_two_of_pacific_university.html)

Hillsboro Argus (1/15/2012):  
[http://www.oregonlive.com/argus/index.ssf/2012/01/pacific\\_university\\_offers\\_free.html](http://www.oregonlive.com/argus/index.ssf/2012/01/pacific_university_offers_free.html)

Blog article (1/19/2012): <http://findtomorrowtoday.org/2012/01/19/pacific-university-offers-free-computer-camp-for-girls/>

Oregon Live about G2CS robot team (1/17/2013):  
[http://www.oregonlive.com/beaverton/index.ssf/2013/01/beaverton\\_robotchix\\_have\\_p.html](http://www.oregonlive.com/beaverton/index.ssf/2013/01/beaverton_robotchix_have_p.html)

G2CS RobotChiX came in 4th in the state championships:  
[http://www.ortop.org/Documents/FLL\\_2012\\_CT\\_Awards\\_2012-01-20.pdf](http://www.ortop.org/Documents/FLL_2012_CT_Awards_2012-01-20.pdf)

Camp USA (2/14/2012): <http://www.interexchange.org/camp-usa/news/camp-time-new-experience>

ICT Resources:  
[http://www.mpict.org/ict\\_educator\\_resources\\_improving\\_ict\\_diversity.html](http://www.mpict.org/ict_educator_resources_improving_ict_diversity.html)

ACM Tech News (7/15/11): <http://technews.acm.org/archives.cfm?fo=2011-07-jul/jul-20-2011.html>

### **Teacher Dissemination:**

Teachers from the 2011 and 2012 summer camps have reported sessions in which they met with other teachers in their district to share what they had learned through their participation in G2CS. In addition, they brainstormed opportunities for recruitment of students for future camps and even sparked enthusiasm for collaboration between disciplines within the school (science/mathematics/computer science).

### **Participant Dissemination**

Here is one example of an enthusiastic G2CS camper's efforts to share information about the camp:

"I am excited to let you know that I have been doing my best to spread the word about the camp and let girls know about all the great opportunities it brings. At the reunion, I picked up each of the papers, then on Wednesday, I got permission from my principal and all of the teachers to go around and talk about the camp, how great it was and all of the amazing opportunities it brings. I am pleased to say that just this morning, I handed out 12 copies of the application to some of my peers. I also talked to them a lot about what we did and what was my favorite parts about the camp. Lastly I wore my G2CS shirt and all four of my lanyards to show them.

Sincerely, 2012 Camper"

### **OPB Role:**

Oregon Public Broadcasting has been a partner in the G<sup>2</sup>CS project and has played a major role in the dissemination of information about the grant and about women in computer science during the first year. OPB has produced an excellent informational video about the camp which is now posted on the G<sup>2</sup>CS website: <http://www.g2cs.org/diy/video/> The website also contains OPB-developed profiles of females who use computers extensively in their professional careers.

### **Conclusions:**

Reviewing the initial research questions, this evaluator has sufficient data to draw various conclusions regarding the two years of the G<sup>2</sup>CS camp.

1) Have the camp curriculum and the instructors' methods instilled in student participants an understanding and appreciation of women as leaders in science? How has this impacted the students?

*2011: Yes, the camp instilled in the participants an understanding and appreciation of women as leaders in science. The strongest evidence for this comes in the post-camp participants' surveys as well as in the parent post-camp survey.*

*2012: Yes. In the post-camp surveys, students reported that the camp opened their eyes to all the new roles and possibilities there are for women in positions of leadership in science. They learned there are more women as science leaders than they previously thought. They commented that women really do have a role in computer science and that they can contribute as much as men do. They appreciated the leadership role of the camp instructors who were all women. Parents commented that the field trips were a terrific aspect of the camp; seeing women at work in STEM fields had a positive impact on their daughters.*

2) Have the activities of the grant served to increase students' confidence and skills? What is their long-term effect? Have they impacted students' career plans guiding them toward science, particularly computer science?

*2011: Yes, the camp activities and curriculum have increased the students' confidence and skills in using the computer but beyond that as well. Some of the typical post-camp quotes were "It has made me much more comfortable using a computer and trouble-shooting" and "Now I don't give up if I don't find what I am looking for" and "Computers and technology are not scary any more." Over time, we will be able to learn whether there has been a long-term effect past six months.*

*On the post-camp survey, students demonstrated an increased interest in math and computer science as career opportunities. Essentially all of them indicated an interest in STEM fields and/or Computer Science along with the recognition that no matter what career they choose, effective use of computers will be an essential part of their career.*

*2012: Yes. Between the Pre-/Post-Surveys, there was a statistically significant change in students' attitudes toward a possible career in computer science or technology so we can*



*conclude that the camp lessons and activities had a positive impact on students' future plans. It is clear from the changes in the Pre-/Post-Survey that the students have a much broader, more complete understanding of the computer science profession as a result of the camp.*

*Six months following the end of camp – on the Follow-up Reunion Survey – the students unanimously reported an increase in their confidence in using technology and in their understanding of computer science. Also: The mean of all 24 quantitative items was 4.00 – “More than Before”. Since these items were based on the national technology standards for students (ISTE NETS•S), the camp clearly served its purpose well in preparing students in the knowledge of and appropriate use of technology.*

3) Has the establishment of a learning community been effective in meeting the other project goals?

*2011: Yes. The girls responded very favorably to the camp curriculum, to the instructors' methods, and to the instructors themselves. They appreciated having all-female leaders/organizers and demonstrated an increased interest in math and computer science as career opportunities. They reported an increased awareness of the value of collaborating within a team in order to problem-solve effectively, and an increase in persistence in order to complete a difficult task. These collaborative efforts should be viewed as components of the broader learning community. In addition, they valued the social networking opportunity, but at this point, it is unknown whether the latter contributed to the overall effectiveness of the project.*

*2012: Yes. Reviewing the “Two-Minute Daily Papers” and surveys, it is clear that the students valued the relationships they had with the other camp participants and the staff; they looked forward to camp activities each day and functioned within their comfort zone. While the majority of the participants indicated that they are now considering a STEM career, especially in computer science, there was a dramatic increase in their understanding of the value of teamwork in accomplishing a goal – both during the camp and on the job. Parents' comments indicated that the community of girls and staff had provided a very positive learning opportunity and social structure for their daughters. Because such a supportive risk-free environment was established from the beginning of camp, the participants were able to problem-solve in groups, travel together (e.g. local bus; field trips), and participate in discussions with useful comments and insightful questions.*

4) Has the project leadership disseminated the results of the project effectively through both traditional and innovative means?

*2011 and 2012: Yes – from the very beginning of the grant project there have been numerous presentations, papers, posters, and articles, and many more are planned. The G<sup>2</sup>CS website is an outstanding tool for dissemination, containing a video of the first annual girls' camp, interactive games, and information about the curriculum. The website provides a wealth of information for students, teachers, parents, and anyone seeking to learn more about the NSF-sponsored camp and its design. OPB has played a significant role in the dissemination activities, especially in developing the video and in the preparation of on-line*

*video interviews of female professionals and their use of technology in their careers . Several articles have appeared in print and electronic media describing the camp nationally. In addition, the middle school teachers associated with the project are sharing knowledge gained and curriculum ideas with other teachers.*

## **Recommendations for Subsequent Years' Camps**

Based on the analysis of data from the 2012 camp, the following recommendations are provide by the evaluator.

1. Develop a Knowledge/Skills Assessment, based on Objectives established by each of the four weeks' instructors.
2. Develop a clear documentation of all assessments to be done and establish a calendar for implementation:

Prior to camp, have students complete the Pre-Camp Student Survey (Appendix I)

Prior to camp, have students complete the Knowledge/Skills Assessment (#1 above)

Continue the Daily Two-Minute Evaluations each day of camp

At the end of camp, utilize the Post-Camp Student Survey (Appendix I)

At the end of camp, utilize the Knowledge/Skills Assessment (#1 above)

At the reunion, approximately six months after camp, use the Student Follow-up Survey *including* the Field Trip evaluation.

3. Because the Pre- and Post-Camp student survey will be very long once the four-week Knowledge/Skills Assessment are added in, review the survey to determine which items can be eliminated without loss of valuable information. For example, in the first two years of camp, there have been *no* statistically significant changes in any of the items in V. Peer and Teacher Attitudes, nor are their likely to be any. Consider dropping this section altogether.
4. Implement the recommended Interview Protocols (Appendix IX), perhaps by Survey Monkey – for prior participants and for prior teachers.
5. Continue to use the Parent Final Evaluation at the end of Camp in the format used this year (2012).
6. Review field trip evaluations and participants comments. Be certain that each field trip justifies the amount of time taken from instruction.

## G2CS Opening Student Survey 2013

### 1. Student Inventory

**\*1. Grade you will complete in June 2013:**

7th

8th

Other (please specify)

**\*2. How would you describe yourself? (if you are mixed please select more than one)**

American Indian or Alaskan Native

Black or African American, Non-Hispanic

Native Hawaiian or other Pacific Islander

Asian

White, Non-Hispanic

Hispanic or Latino

Prefer Not to Report

Other (please specify)

**\*3. If your mother is in your life, what is the highest level of education she received?**

Some High School

High School Diploma

Some College

College Degree

Master's Degree

Ph.D, MD or JD

Unknown

**\*5. If your father is in your life, what is the highest level of education he received?**

- Some High School
- High School Diploma
- Some College
- College Degree
- Master's Degree
- Ph.D, MD or JD
- Unknown

**6. What is your father's occupation?**

5

6

## 2. Student Inventory

How much do you agree with each of the following statements?

### \*1. I forget most of what I learn.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### \*2. I can give a good talk in front of my class.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### \*3. It is easy for me to do well in math.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### \*4. I often feel that I am doing badly in math.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### \*5. I get good grades in math if I want to.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### \*6. I finish my math work more quickly than the other students.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### \*7. I like math.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### \*8. I like science.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### \*9. Science is hard for me.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### \*10. I feel I am doing well in science.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*11. I am a good science student.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*12. I get good grades in science if I want to.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*13. I use computers regularly throughout school.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*14. When problem solving I prefer to work alone.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*15. I avoid coming into contact with computers in school.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*16. When working in a small group doing problem solving I prefer to work with boys.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*17. When working in a small group doing problem solving I prefer to work with girls.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*18. I can usually make a computer do what I want it to.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*19. I could probably teach myself most of the things I need to know about computers.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*20. I need an experienced person nearby when I use the computer.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*21. If I have problems using the computer, I can usually solve them one way or another.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
				

**\*22. Computers are difficult to use.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
				

**\*23. Once I start to work on the computer, I find it hard to stop.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
				

**\*24. I'm no good with computers.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
				

**\*25. I have a lot of self-confidence when it comes to working with computers.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
				

**\*26. I don't think I could do advanced computer work.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
				

### 3. Attitudes Towards Computer Science

How much do you agree with each of the following statements?

**\*1. Describe what you think a typical computer scientist does at work each day.**

5

**\*2. People who have “computer jobs” sit in front of a computer screen all day.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*3. Working with computers means working on your own.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*4. Most computer scientists are men.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*5. You have to be brainy to work with computers.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*6. To get a computer job, you have to work really hard.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*7. In general, boys are better than girls at using computers.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*8. Girls are as good as boys when learning to use a computer.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*9. Learning about computers is worthwhile.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*10. I think technology is mainly for boys.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*11. I positively do not want to have a job that uses a lot of technology.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*12. I don't want to learn any more about computers than I need to make them work.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*13. Girls can do technology as well as boys.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*14. I will use computers in many ways during my life.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*15. Careers in computers and technology are exciting.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*16. I would like a job working with computers or technology.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*17. When I use technology, I think about how it works.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*18. I like the challenge of learning how to use a new technology.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



**\*19. Women computers scientists are not taken seriously in our society.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree



## 4. Career Goals

How much do you agree with each of the following statements?


**\*1. People who work with computers make really good money.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*2. In high school I intend to take a math class every year.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree






**\*3. In high school I intend to take a computer science class.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*4. In high school I intend to take biology, chemistry, and physics.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*5. I plan to attend college.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*6. In college I intend to major in math.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree


**\*7. In college I intend to major in computer science.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*8. In college I intend to major in science.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*9. I intend to have a career that uses math, science, and/or computer science.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*10. I intend to get an advanced degree in math, science, or computer science. (A Master's Degree or PhD).**

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree



## 5. Parental Attitudes

Think about the adults raising you. How much do you agree or disagree with the following statements about them.

**\*1. They would be disappointed if I got a job working with computers or technology.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*2. They want me to get a job right after high school instead of going to college.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*3. They would be surprised if I went to college.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*4. They expect me to go to college.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*5. They would be excited if I decided to become an engineer or computer scientist.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*6. They think that a career working with computers or technology is better for boys than for girls.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*7. They can help me plan for college.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*8. My mother is proud of my success in math.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*9. I get the most help in math from my father.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\*10. I get the most help in science from my mother.**

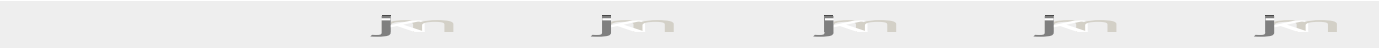
Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree



## 6. Peer and Teacher Attitudes

Think about your friends, students in school, and your teachers. How much do you agree or disagree with the following statements about them.

**\*1. My friends only use computers at school when they are told to.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*2. My friends think that learning about computers is a waste of time.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*3. I have friends who are interested in computers.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*4. My teachers or counselors discourage me from taking math classes.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*5. My teachers at school think that I should not consider a career in computers and technology.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

**\*6. My friends often want me to help them on computers.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

## 7. Computer Scientist Tasks

I am interested in...

**\*1. ...writing a program that tutors kids in arithmetic.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

*jn      jn      jn      jn      jn*

**\*2. ...designing the menus in MS Word so it's easy to figure out what to do.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

*jn      jn      jn      jn      jn*

**\*3. ... providing technical help to the police to catch people who break into the internet.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

*jn      jn      jn      jn      jn*

**\*4. ...programming the robots that go into collapsed mines to find survivors.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

*jn      jn      jn      jn      jn*

**\*5. ...writing the programs that control a space shuttle.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

*jn      jn      jn      jn      jn*

**\*6. ... writing computer software for an insurance company.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

*jn      jn      jn      jn      jn*

**\*7. ...designing programs that doctors can use in hospitals to make sure patients get the right drugs.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

*jn      jn      jn      jn      jn*

**\*8. ...designing new computers for Dell or IBM.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

*jn      jn      jn      jn      jn*

**\*9. ...writing a computer simulation to study the effects of deforestation on animal habitats.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

*jn      jn      jn      jn      jn*

**\*10. ...writing an application for cell phones to calculate a person's carbon footprint.**

Strongly Disagree      Disagree      Neutral      Agree      Strongly Agree

## Appendix II: Two-Minute Daily Evaluations

(All response items below are listed in order of frequency. Often items exceed the number of respondents since many times they provided more than one answer.)

Date: June 18, 2012

<b>Describe what you liked best today.</b>								
Meeting everyone								16
Getting my G2CS account								7
Learning about electronics (PC power source, wires, blog, hardware, etc.)								5
Researching								5
Cameras								2
Everything								2
"I enjoyed meeting so many other girls like me."								1
<b>Describe what you think we should have done differently.</b>								
Nothing								18
More time (activities, research)								8
Going faster on the notes								2
Should have had more gadget options								2
<b>Describe what you learned today that will be useful in your future.</b>								
Electronics (SATA hard drives, cell phones, RAM, speakers, LED/LCD monitors, remotes)								19
Safety precautions when using electronics								9
How to use a digital camera								5
<b>Is there anything else you want us to know?</b>								
No								22
"Cookies were great!"								3
"I had fun!"								3
"I love the camera"								2
"I am really enjoying meeting all of you."								1
<b>Please provide a general rating for today.</b>								
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean	
0	0	4	2	12	9	2	5.1	

Date: June 19, 2012

<b>Describe what you liked best today.</b>								
Dissecting the devices/gizmos (printer, phones, GPS)								23
Preparing and listening to presentations on the devices								7
Food								2
Editing camera photos								1
Socializing with other campers								1
<b>Describe what you think we should have done differently;</b>								
More time (research, activities, presentations)								15
Nothing								14
The program was difficult to use.								1
<b>Describe what you learned today that will be useful in your future.</b>								
Everything we learned from research, dissection presentations								22
How to make a presentation and use Wiki spaces								6
How to use the camera editing software								1
Prezis								1
<b>Is there anything else you want us to know?</b>								
No								22
"I'm not a fan of the cheese dip"								2
"It was fun!"								7
"Today was well-planned."								1
"I want to learn more about the gadgets"								1



Please provide a general rating for today.							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	0	1	11	10	8	5.8

Date: June 20, 2012

Please provide a general rating for today.							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	1	1	2	13	15	6.3

<b>Describe what you liked best today.</b>		
OMSI (exploring exhibits, IMAX movie, labs)		21
Interviewing and presenting our interview results		6
Visiting OPB		9
<b>Describe what you think we should have done differently;</b>		
Nothing		16
More time (at OMSI, at OPB, at lunch)		10
Getting to the bus station early was a problem for me		1
Didn't like the sandwiches		3
<b>Describe what you learned today that will be useful in your future.</b>		
How to interview; how to ask good questions		14
OPB: how editing is done and technology is used		10
"I learned about tornados and natural disasters."		3
That women can do as much as men do.		1
To always "be yourself"		1
I learned about dinosaur fossils.		1
Never give up!		1
<b>Is there anything else you want us to know?</b>		
No		25
"I am having SOOOO much fun at this camp!"		4
I lost my camera.		1

Date: June 21, 2012

<b>Describe what you liked best today.</b>		
Volleyball game		16
The tour around Pacific campus		15
Designing the T-shirt		7
Learning about the parts of a computer		6
Maggie's Buns snack		2
<b>Describe what you think we should have done differently;</b>		
Nothing		16
More time (T-shirt designs, volleyball, tour)		8
More breaks for water		2
Get portable air conditioners		1
I'd like healthier snacks		1
<b>Describe what you learned today that will be useful in your future.</b>		
The parts of a computer and their function		18
Knowing my way around campus (dorm rooms, chemistry, CS, concerts, etc.)		8
3D		2
Biology and technology knowledge will be useful in our future.		1
<b>Is there anything else you want us to know?</b>		

No	30						
"Today was fun!"	2						
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	0	0	9	18	7	5.9

Date: June 23, 2012

<b>Describe what you liked best today.</b>							
Binary numbers activity							14
Testing parts of the computer ("breaking it" and putting it back together)							9
OPB blogs/posts							4
Lunch/ice cream							2
Making scrapbooks							2
Learning about the Linux computer program							2
Pizza snack							1
Making problems for the computer to solve							1
<b>Describe what you think we should have done differently;</b>							
Nothing							25
More time (testing, re-building, Linux)							2
"It was fun!"							3
Had nap time							1
<b>Describe what you learned today that will be useful in your future.</b>							
What binary numbers are and how to use them							16
How to take apart a computer and put it back together							12
How to fix an error in a computer program							2
Linux							2
How to put an image on our blog							1
<b>Is there anything else you want us to know?</b>							
No							28
"I really enjoy the hands-on labs"							2
"I had fun!"							1
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	1	1	19	9	1	5.3

Date: June 25, 2012

<b>Describe what you liked best today.</b>							
Learning about the Internet, www, routers, HTML							13
The robots (Ashleigh and Dr. Khoja making PB&J sandwiches)							12
The parachute game							5
Freeze tag							3
The lab activities							1
Flying Rhino games							1
<b>Describe what you think we should have done differently;</b>							
Nothing							25
More time (OPB blogs, free time)							3
Snack (didn't like raisins, celery)							4
<b>Describe what you learned today that will be useful in your future.</b>							
Internet, HTML, network, router							29

That exact directions are necessary for good programs	6						
<b>Is there anything else you want us to know?</b>							
No	25						
"I loved freeze tag!"	2						
"I really enjoy the labs"	1						
"I have made a web page in HTML"	1						
"I am always ready to learn more"	1						
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	0	0	16	16	3	5.6

Date: June 26, 2012

<b>Describe what you liked best today.</b>							
Flying Rhino (tour, spider lesson, learning what they produce and how they do animation)	20						
Creating an app at Web MD	16						
<b>Describe what you think we should have done differently;</b>							
Nothing	24						
More time (WebMD app; bathroom stops; explore Flying Rhino)	7						
More snacks	1						
<b>Describe what you learned today that will be useful in your future.</b>							
WebMD (what people do, how to build an app)	15						
Flying Rhino (what people do)	13						
Fellow your dreams; choose a career that fascinates you	3						
How to work as part of a team	3						
<b>Is there anything else you want us to know?</b>							
No	27						
"It was very fun!"	6						
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	0	0	7	21	7	6.0

Date: June 27, 2012

<b>Describe what you liked best today</b>	
Working on a 3D object	20
Volleyball	6
Binary searching	4
Battleship game	2
We weren't rushed today.	2
Spending time with friends	1
Dessert	1
<b>Describe what you think we should have done differently;</b>	
Nothing	20
More time (blogs, lunch, 3D activity, battleship)	7
Should have played kickball	4
Volleyball	1
<b>Describe what you learned today that will be useful in your future.</b>	
Searching systems	15
Pixels and image compression	9
3D activity	2
Tinker CAD	1

"Everything we learned today will be useful"	1						
Different ways of solving number problems	1						
How to play Battleship well	1						
<b>Is there anything else you want us to know?</b>							
No	23						
"I love this camp!"	3						
"I like Ashleigh"	2						
"I'm super excited for tomorrow"	1						
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	0	3	15	15	1	5.4

Date: July 1, 2012

<b>Describe what you liked best today.</b>							
Amazon (presentations about their jobs, playing Sweet or Sour, seeing the dogs, tour)	15						
UW (tour of CS, dorms, campus)	11						
The guy who worked on hacking into cars	3						
Food, breakfast	3						
Remote controlled car	2						
<b>Describe what you think we should have done differently;</b>							
Nothing	18						
More time (sleep, Amazon, UW)	6						
Keep on time	1						
More snacks	1						
Too many elevators and stairs	1						
Lunch was gross	1						
<b>Describe what you learned today that will be useful in your future.</b>							
Amazon (careers, technology applications, dogs)	16						
People can hack into cars	4						
UW (classes, dorms, campus)	3						
"I learned to be aware of the dangers of technology"	1						
Advice from pancakes	1						
Online shopping sites	1						
How to play LightBot	1						
<b>Is there anything else you want us to know?</b>							
No	25						
"I would like to go to UW"	1						
"Really fun!"	1						
Visiting the space needle would have been educational	1						
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	0	0	13	19	1	5.6

Date: July 3, 2012

<b>Describe what you liked best today.</b>	
Alice (programming, making film, developing presentation)	30
Kickball	4
Lunch	1
<b>Describe what you think we should have done differently;</b>	

Nothing	19						
More time (Alice, presentations)	5						
Don't play kickball two days in a row	2						
Should have done something else other than just Alice all day	1						
<b>Describe what you learned today that will be useful in your future.</b>							
Alice: learning a computer language, how to do programming, animation	28						
"I learned that to program you first have to have a plan"	1						
"I learned that mixing fairies and zombies is a bad idea."	1						
"I love Alice!"	1						
<b>Is there anything else you want us to know?</b>							
No	22						
More time for Alice	2						
Lunch was amazing!	3						
"I really enjoy working on Alice!"	2						
"I don't really like kickball, but everyone else does, so . . ."	1						
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	2	1	0	12	21	6	5.6

Date: July 6, 2012

<b>Describe what you liked best today.</b>							
Alice (finishing project, planning presentation, watching presentations)	23						
Playing soccer	11						
Getting the "I will always love you" song	1						
Awesome snack	1						
"Can't decide what I like best; whole day was great"	1						
<b>Describe what you think we should have done differently;</b>							
Nothing	22						
More time (Alice, soccer)	4						
"I didn't like playing soccer in the heat"	2						
Should have warned us we'd be playing soccer	1						
"We should play soccer more often and longer."	1						
<b>Describe what you learned today that will be useful in your future.</b>							
Alice (programming, movies, squids)	17						
That technology doesn't always do what you want it to	3						
How to focus a presentation so you finish on time	3						
Kicking a soccer ball	1						
"I can use Alice for working on future stories at home"	1						
<b>Is there anything else you want us to know?</b>							
No	25						
"Wonderfully amazing day"	1						
"I did not like playing soccer; I'm bad at soccer"	1						
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	0	1	16	17	2	5.6

Date: July 9, 2012

<b>Describe what you liked best today.</b>								
Robots (building, programming, testing)								26
Basketball game								9
"I liked building the robots but not the programming"								1
<b>Describe what you think we should have done differently;</b>								
Nothing								18
More time (robots, basketball)								6
Made the teams more even in basketball								2
Instructions weren't clear enough								2
We wasted some time before the first break								2
Needed bigger trays for parts								1
<b>Describe what you learned today that will be useful in your future.</b>								
Programming robots								28
Building robots by following directions carefully								7
"I learned that sometimes things don't work and you have to try again and again"								1
<b>Is there anything else you want us to know?</b>								
No								23
More time for building Legos and programming								2
"I'm very sad this is the last week of camp"								1
<b>Please provide a general rating for today.</b>								
1.	2.	3.	4.	5.	6.	7.	Mean	
Boring	Could have been more interesting	Neutral	Mediocre	Interesting	Fascinating	Best day so far		
0	0	0	1	1	19	4	5.7	

Date: July 11, 2012

<b>Describe what you liked best today</b>								
Intel tour, museum, robots, Radia Perlman								25
Microsoft (electrical circuits, speeches, talking to employees/ volunteers at lunch)								12
<b>Describe what you think we should have done differently;</b>								
Nothing								9
More time (robots, lunch, exploring Intel)								7
Shorter speeches from the employees								4
More about how Intel works								3
Spend less time on robotics								1
Longer day								1
More breaks								1
<b>Describe what you learned today that will be useful in your future.</b>								
Programming robots								7
What Intel does								6
There are many companies I want to intern at or work for								4
What Radia Perlman talked about								3
That there are more robotics teams								3
Electric circuits								2
"I learned that you have to adapt to whatever situation you are in"								1
To never give up your dreams								1
The "Girls Get It" camp								1
"I learned that it is really fun to program robots"								1
Everything								1
<b>Is there anything else you want us to know?</b>								
No								27
"I loved it"								1

"I don't really enjoy robots"							2
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	1	1	1	15	16	2	5.4

Date: July 12, 2012

<b>Describe what you liked best today</b>							
Robots (building; programming to throw balls, follow blue line)							25
Painting the bench							4
Friendship bracelets							2
<b>Describe what you think we should have done differently;</b>							
Nothing							17
More time (robots, presentations, bracelets)							6
Clearer instructions							1
More breaks to decrease stress							1
More space for working on robots							1
"Make this week last longer"							1
"I think masks would have been wise during spray painting"							1
<b>Describe what you learned today that will be useful in your future.</b>							
Robots (building, programming)							23
Things don't always go the way you planned							4
How to make friendship bracelets							1
"Hard work pays off"							1
<b>Is there anything else you want us to know?</b>							
No							27
"I learned how to program my robot to sense color!"							1
"I love programming"							1
"Programming is hard, but it is important to never give up!"							1
"The camp has gone by really fast"							1
"I got to the point that I wanted to violently smash my robot"							1
<b>Please provide a general rating for today.</b>							
1. Boring	2. Could have been more interesting	3. Neutral	4. Mediocre	5. Interesting	6. Fascinating	7. Best day so far	Mean
0	0	0	3	21	15	2	5.4

### Appendix III: Ethnicity of Camp Participants

How would you describe yourself? (If you are of mixed ethnicity, please select more than one)

	Response Percent	Response Count
American Indian or Alaskan Native	0.0%	0
Black or African American, Non-Hispanic	2.8%	1
Native Hawaiian or other Pacific Islander	0.0%	0
Asian	11.1%	4
White, Non-Hispanic	50.0%	18
Hispanic or Latino	16.7%	6
Prefer Not to Report	11.1%	4
Other (please specify)		
Brazilian-American – 1		
Mixed – 1	8.3%	3
Irish-German – 1		



## Appendix IV: Student Follow-up Reunion Survey

### 2012 Student Reunion Survey

<b>1. I apply existing knowledge to generate new ideas, products, or processes.</b>						
Much less than before	Less than	No change	More than	Much more than before	Mean	
0	0	4	23	12	4.21	
<b>2. I create original works as a means of personal or group expression.</b>						
Much less than before	Less than	No change	More than	Much more than before	Mean	
0	0	9	18	12	4.08	
<b>3. I use models and simulations to explore complex systems and issues.</b>						
Much less than before	Less than	No change	More than	Much more than before	Mean	
0	0	11	16	12	4.03	
<b>4. I identify trends and forecast possibilities.</b>						
Much less than before	Less than	No change	More than	Much more than before	Mean	
0	1	12	21	5	3.77	
<b>5. I interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.</b>						
Much less than before	Less than	No change	More than	Much more than before	Mean	
0	0	10	16	13	4.08	
<b>6. I communicate information and ideas effectively to multiple audiences using a variety of media and formats.</b>						
Much less than before	Less than	No change	More than	Much more than before	Mean	
0	0	7	19	13	4.15	
<b>7. I develop cultural understanding and global awareness by engaging with learners of other cultures.</b>						
Much less than before	Less than	No change	More than	Much more than before	Mean	
0	0	16	15	8	3.79	
<b>8. I contribute to project teams to produce original works or solve problems.</b>						
Much less than before	Less than	No change	More than	Much more than before	Mean	
0	1	9	17	12	4.03	
<b>9. I plan strategies to guide inquiry.</b>						
Much less than before	Less than	No change	More than	Much more than before	Mean	
0	1	13	14	11	3.90	

<b>10. I locate, organize, analyze, evaluate, synthesize, and ethically use information for a variety of sources and media.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	9	18	12	4.08
<b>11. I evaluate and select information sources and digital tools based on the appropriateness to specific tasks.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	9	19	11	4.05
<b>12. I process data and report results.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	10	20	9	3.97
<b>13. I identify and define authentic problems and significant questions for investigation.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	1	8	20	10	4.00
<b>14. I plan and manage activities to develop a solution or complete a project.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	10	17	12	4.05
<b>15. I collect and analyze data to identify solutions and/or make informed decisions.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	10	18	11	4.03
<b>16. I use multiple processes and diverse perspectives to explore alternative solutions.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	10	20	9	3.97
<b>17. I advocate and practice safe, legal, and responsible use of information and technology.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	17	13	9	3.79
<b>18. I exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	6	19	14	4.21
<b>19. I demonstrate personal responsibility for lifelong learning.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	5	20	14	4.23

<b>20. I exhibit leadership for digital citizenship.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	12	13	14	4.05
<b>21. I understand and use technology systems.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	1	21	17	4.41
<b>22. I select and use applications effectively and productively.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	7	18	14	4.18
<b>23. I troubleshoot systems and applications.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	15	17	7	3.79
<b>24. I transfer current knowledge to learning of new technologies.</b>						
	<b>Much less than before</b>	<b>Less than</b>	<b>No change</b>	<b>More than</b>	<b>Much more than before</b>	<b>Mean</b>
	0	0	5	15	19	4.36

**25. Explain how your experience with G2CS has changed your understanding of women as leaders in science.**

It really helped open my eyes to all the new roles and possibilities there are for women in positions of leadership in science.

g2cs has changed my understanding because i now know that the "science world" needs more female leaders and that the whole reason why g2cs was made was to show young girls (like me) that we need more female leaders in science

Being in the G2CS program has showed me that there are currently few women in the technology field, but we are more than capable of succeeding in the field.

It really helped me see that women can be leaders and that we can be just as good as men when it comes to technology and computer science.

When I got together with women who were interested in science technology, I was so relieved because I was not alone. Getting to work with them was better because I learned from lots of smart girls and they helped me realize that it's not just for men. Women can do just as well in this field.

When I was apart of G2CS I learned more than I ever learned in a classroom. I didn't ever picture women in that field before.

G2CS showed me the career paths a woman could take in the fields of science and math. I learned that being a female scientist/engineer/scientific entrepreneur might not be the easiest path, but is definitely a rewarding one. G2CS taught me that there are many job possibilities in the field of science, and that some of those options could be the perfect match for me.

My experience with G2CS has changed my perspective with other woman because I now know that they are really smart and have more opportunities now that we have learned more about computers.

G2cs has enhanced my knowledge about women in science a lot. Before this camp I knew one or two women and after I meet and learned about some very hardworking women. It was so inspiring to be able to see what they do and things I might be interested in doing.

It hasn't really

Before G2CS, I thought that when it came to computer science, men were much better than women, and I had absolutely no chance. After seeing all of these women during field trips, I appreciate what they do and how they do it a lot more than before. I now have a lot of role models!

I learned that women really do have a role in computer science and that they can contribute as much information as men do.

It has made me want to be more of a leader and want to do a job where there aren't very many women.

I had no idea how few woman there were in science careers. Or how few are actually somewhat "leaders" in the field.

Women make important changes in science.

During G2CS I had the chance to work with all females with technology which is different than in the classroom... Where the boys seem to think they dominate the use of technology. Anyway, that's what I notice. But after the camp I now have proof and know that that is not always the case. Women work in the fields as well and are becoming much more prominent than they once were.

Almost all of our camp instructors were women, and they were awesome and well respected. I found out that there are more women as science leaders than I previously thought after going on the field trips; one question that was almost always asked was what the ratio of men to women was. At Intel, we were told that groups work together better when there's a mix of men and women because women are typically better at communicating with others than men.

G2CS showed me that women can do just as many things as men in all fields of work, especially science which is a male-dominant field.

My experience with G2CS was incredible, and it really made me see that there are more women in science, and that there are more and more women going into science everyday.

Meeting all the great women leaders i did the past summer has changed my understanding of their roles in science because i realized not many other people know that women are as equal as any other human in their capabilities to learn and pursue science.

That really a women is needed in every aspect of science or any field of work and that they are great contributors to the field even if a man seems to be the dominate leader of the field.

I had never really thought about men dominating the science field. Now I have really appreciated the amount of care females leaders put into their science jobs.

They don't have to be nerdy and boring, they can be cool and happy.

I think that women can do anything that men can do and this camp really proved that to me. We went to labs where there were a majority of women workers. We were exposed to lots of interesting technology jobs that I think I might want to pursue. I think that this camp enforced the idea that women are just as smart and have just as much potential as men.

My experience with G2CS has changed my understanding of women as leaders in science by showing me how few women there are in this field, and how the women have to be above average in all they do to get where they are.

Not only did I become aware that there are very few women in computer science, but I learned how important it is to have diversity in a field of study. It's important to have more women in computer science because they can provide different insights and perspectives to solve problems.

I've never really known a lot of women in this line of work, and just assumed it was because it simply wasn't meant for women. But now, I know that women are every bit as capable as any other person; maybe even better.

Attending G2CS has helped me learn that Women can take the lead on project. We can do exactly if not more than what males can do. Mostly because Science is considered a man field means us women need to step up and show we can do the same if not more.

G2cs helped me understand how important women are in the science field, and with helping create new ideas.

Before I went to G2CS I didn't really have much interest in computer science. During G2CS, I really liked the html that we did and decided to take a web design class at school. Now, I'm taking Java Programming and I would like to take IB Comp Sci, Web Design 2 and Graphic Design next year.

I already felt that women were very important to the development and creativity of technology, but I was pleasantly surprised by the HUGE advances that women had made, even though there is still a rather meager amount in the technological fields. I also learned that different viewpoints are very important for technology, and women most definitely help to provide that aspect.

I always knew that I wanted to do something that involved engineering, g2cs has helped cement my beliefs. Part of what contributed to this was meeting women and seeing how they fared in their lines of work.

The thought of women in science had never been relevant in my mind before, but I hadn't ever imagined them being leaders. Now after I have experienced more in the technological field that picture stands clear.

I knew and still know that there aren't many women as leaders in the scientific world, but that doesn't mean i cant do it. G2CS showed me that i am fully capable of doing whatever i want to do with my life and i want to make a difference in the scientific world.

Before G2CS, I did not know that there were many women leading science, I thought it was mainly men. But during the field trips during the camp, I met so many women who had the same goals as I did and I realize now that it is very acceptable for me to work towards computer science in my career.

By being a part of G2CS I have become involved in science, even more then I was before the camp. My understanding has influenced, and I have realized that the majority of coumpter science is men. The women that we meet throughout the camp were amazing and they truly loved what they did. I fell as if meeting those people helped me understand that more women are needed any that we do make a huge difference in the workplace.

G2Cs has shown me that jobs in science are not just for men but also for women.

## **26. How has your experience with G2CS affected your confidence in your ability to use technology?**

G2CS has taught me so much and encouraged me to explore new technologies. For that, I'm really grateful.

g2cs has affected my confidence in my ability to use tech. because i now know way more things on how a computer works and looking at a little devise and seeing all the little thing that are inside, its really cool!

Being in the G2CS program has made me more familiarized with different technology, and I am much more confident with experimenting and solving problems on my own.

My confidence has boosted rapidly and continues to the more I learn and explore computers. I do think G2CS was a big push for me that really made me want to learn more about computers and technology.

Before I was in the camp, I knew I liked technology, but there are no classes in high school that teach very much about it at all. Once I was able to mess around with it and have fun at the same time, I wanted to explore more and more instead of just thinking about it.

I was not very tech-savvy so it helped me gain more knowledge and become friends with computers. :)

Before I went to G2CS I was on the bottom end of okay with powerpoint and decent at using word, those were pretty much the extent of my technological knowledge. After G2CS I was proficient at three programming languages (Alice, LEGO Mindstorms, and HTML), able to not only take apart a computer, but name the peices I found inside and put it back together, and see a new piece of technology and be able to form a theory on how it worked.

I can now use technology better than I used to and I'm a lot more comfortable.

My confidence with technology has become higher due to all of the field trips and the wide variety of science fields that as saw. I feel as if now a days I have a problem on my p.c. I can attempt to fix it with my knew knowledge instead of just asking my parents to come and do it for me.

It taught me lots of stuff.

After G2CS, when it comes to computers, I feel very confident. During school if there is a technological problem, I always try to help, because I know that I can help. Since G2CS, I have been able to achieve things I had never thought I could before, and I understand a lot more as well.

I am much more confident in my ability to use technology. For example, since I have learned about HTML code, I have used a lot more than I had before, and I feel much more confident about using it.

It has boosted and made me want to use technology more.

Now that I have G2CS experiences "under my belt" I always feel confident when using technology. I'm the one my friends come to when they are having trouble.

Because of the camp, I'm taking computer programming classes in High School.

G2CS opened my mind to new ideas using computer apps instead of pen and paper. Like CAD for drafting and such. My confidence with sharing information is what changed most dramatically though. As I now feel I can make videos and presentations and share them more easily than I once did.

G2cs has increased my confidence in my ability to use technology by giving me a chance to work with other girls my age in that subject and use technologies that I would otherwise not be able to use. I now know that I can use different technologies in a group, and just as well as the other.

G2CS didn't affect my confidence in my ability to use technology because I was already confident before going to camp.

I feel the G2CS has helped me understand technology much more, to the point where my technology actually had me help the rest of the class when we were learning about HTML.

I think im more confident in handling technical situations than i was before camp. if not solving them then at least having a better understanding of what i am doing and the causes of how technology works.

Fine, I use technology and I know more about what I am doing and how to do it. It helped me pass and get a higher score in my technology class because I had prior knowledge, so that is always a good thing. I also am still not great but the more time I spend with it the easier it gets and the better I get.

G2CS taught me how to use many programs I haven't used before, but I also learned how to explore different programs to become comfortable with them.

It has made me more confident when I use the computer.

Before G2CS I knew how to use microsoft pretty well but thats about it. Now i understand why those kind of programs work and I can use many others.

My experience with G2CS affected my confidence in my ability to use technology by giving me the knowledge on how to effectively use technology to complete a variety of tasks.

I've always been pretty confident in technology, but I wasn't very confident in coding and complex programming. However, Alice really inspired me and I understand coding much more now.

Before, when I used computers and had a problem with it, I asked other people for help, but now I attempt to solve the problem on my own. And when my friends have their own technical problem, I attempt to help them as well.

Attending G2CS has helped me learn how to fix my technology without needing assistance of a male. Before I would always ask a boy in class now im walking around helping other students.

I feel more confident to try something on my computer without asking for help.

I had a bit of trouble with computers, but since G2CS helped me decide to take web design, and generally be more involved with computers, I've become better at working with computers and really enjoy it.

I was clueless. After G2CS, I was confident in fixing and trying different things using technology, as well as feeling that my problem solving and analytical thinking skills had improved tremendously. Now I can do something that I have had no prior experience with, technologically speaking, and work it out applying the skills I was taught at camp.

G2Cs has made me much more confident around all forms of technology. I used to freak out whenever a school computer wouldn't start up, now I'm able to fix it, normally within five minutes.

As I begin the camp my use and knowledge of technology was average. Afterwards they shot high as I realized all that I had yet to discover and I continued to search further even after my camp experience came to a close.

Before going to the G2CS camp, honestly, i was scared to even touch it without having the fear of breaking something or having something go wrong. but now, i know how to use it responsibly, i have basic knowledge on writing programs, and know that i will thrive in computer science as i get older.

After learning so much about computers in G2CS, I have a lot more confidence because I know how to use them well.

Before G2CS my confidence in using technology was high, however there were still things that i did not know how to use on a coumpter. Also, i had no idea what was inside a coumpter. After G2CS i know parts of an average coumpter, and I am more confident in using new technology. When we went to Microsoft, being able to create a smart phone app was an awesome expirence! I liked how we were involved in the process and our self esteem was boosted when we could do it. That has also inspired me to explore technology further.

G2Cs has made my understanding of technology much more clear.

It has helped me a lot in confidence because i can go to my computer and see that i can use it and help others if they have a problem.

**27. Has your experience with G2CS had an effect on your future career plans? Please explain.**

At this point, I'm still not sure what my career plans are, but G2CS has helped me see how much the field of computer science has to offer.

It has persuaded me to look into maybe doing something in the science field.

My experience with g2cs hasn't affected my future career plans. i have thought about joining the "science world" but, I'm still not sure what i want to do in the future for my career.

No, G2SC has not really impacted my future career plans. I wanted to be in the program to try something new, but there are other fields that I am more interested in.

Yes it has. Like I said, I already knew I wanted to work with math, science, and technology. It's just that I didn't know what kind before. Now after we did several activities, I was able to try different things. I loved programming the robots and working on the computer with other programs, so I think I am more interested in software engineering but I'm still not 100% sure. G2CS sure did point me in the right direction though.

It opened many more doors. I'm less interested in math and science so I wouldn't have thought myself to be a part of those fields.

I've always wanted a career that would allow me to help people; being a doctor or surgeon was out because blood makes me dizzy; making a lot of money and donating lots to different causes is an option, but one can never be sure of the future so planning on money could be hard; one option the G2CS opened my eyes to was building technology that could save lives. G2CS introduced me to the field of medical engineering, and it's a career path that seems like a real option for me.

Yes it has because I now have more opportunities now that I have more computer knowledge.

Yes. For my career (before g2cs) I wanted to be a lawyer or doctor. However, after attending g2cs I have realized that there is so many more jobs that would fit me, and that I would enjoy more. This camp has shown me some of the many jobs and I would love to go into computer science one day.

It made me more interested in becoming an engineer.

Definitely. Now, as I get ready to go to high school, I am looking at the computer science courses at my possible school choices. I know that I want to look at my choices at what I can do with computer science as a career. Before, I didn't want to do CS. I thought it seemed hard, and that I would never be able to achieve things. But I know now that I can do it. I definitely want to get into it in high school.

Yes; At first, I didn't know much about the field of computer science. Since G2CS, I have been able to gather a lot more information about the field of computer science, and I would like to apply my knowledge of computer science to my future career plans.

I have now thought of being a computer scientist.

Yes, it's quite amazing how much the camp affected my future plans. I was always dead set on being an actress, but after this camp I have no clue because I found out I was good with technology.

The camp made me consider computer science as a career.

G2CS did not have a large effect on my future career plans. But since G2CS, I have explored more computer apps, like CAD apps for drafting and gave me a larger awareness of the tools available to me which will probably help me with my future career.

Yes. When we went to Flying Rhinoceros I saw how much they enjoyed their jobs using computers in film-making and game programming, and I started to think that animation would be nice for a career. Even though employees from the other places we visited expressed their enjoyment for the jobs, I have always been interested in film-making. Also, through g2cs I have learned that I absolutely love computers.

G2CS effected my future career plans because it made me realize I don't want to be a programmer because I really don't like it.

My experience with G2CS has expanded my science - technology choices for my career.

I'm still not entirely sure what I want to do when I am older but the experiences I have had at camp have opened my eyes that if I want to be a better leader, a more influential person in the future I have to think now and start on the road I want to achieve.

Yes and no. I know you wanted me to go into the field of technology and science. But I have decided I will leave the technology part out because it isn't my strong point and go in to the medical field, which I have



been interested in science I was 3 or 4. I will yes use technology but maybe not in the way you hopped. Though don't take it personally I was always interested in Being a Doctor so it would have been really amazing if you had convinced me not to become one. Though I learned lots it just isn't the right field for me.

I haven't thought about my career much, but now I am almost certain that I want to pursue a job in the science or engineering field. This is not my only option, as I might find something else I love to do, but now I am considering doing work in science and technology. In fact, I am doing a computer science fair project for school this year.

It has made me consider a career in computer science.

Yes, a little. I love biology and that's what I want to study but I realized that technology is involved in science so much, even if it's not apparent at first glance. I think that I will want to take some technology classes so that I have a stronger structure for my future.

My experience with G2CS had an effect on my future career plans by educating me on the subjects and helping me to open door to help my education and career blossom.

I really love animation, and before G2CS, the only computer science career I was passionate about was Pixar. At the camp I discovered several more computer science jobs such as Flying Rhino or Microsoft. I'm not positive what job I'll go into, but I know I want to get a career in computer science.

I came into the camp with an open mind, but I didn't know if this was a career for me, but now I plan to pursue a career in technology. It's something that really interests me, and I'm engaging in clubs and classes to expand my knowledge on it.

Yes, before G2CS my future plans were a teacher or chef now I have very well investigated about Computer Science. Mostly on robotics and programming.

I want to go into a career that involves Computer Science, rather than just science.

Yes, before I didn't really know what I wanted to do, I just wanted it to be with math. After signing up for computer classes because I loved the HTML lesson we did, I've decided that I really really want to go into programming software or something of that sort, but I definitely want to go into programming.

I was very unsure of my plans for the future, and still am, but I have become interested in a vast variety of new fields. I am interested in programming, graphic design, and animation, which I may well pursue as a career.

I think that it has made me want to go into engineering even more.

I had no indication of where my future rested when I started the camp. Of course I had dreams, but no idea how to reach them or what steps to take. Now I would greatly treasure a career within the spectrum of computer science and have planned out the path there, who knows though it could always change.

Yes! absolutely. Before, I didn't know what I wanted to be. I knew I had plenty of time to choose, but the faster, the better. After the camp, I knew that I wanted to create technology, work with it and make it better! I always thought about it, but was never really sure, but now I am.

Before coming to G2CS, I was still thinking about what I wanted to be when I grow up. I was considering computer science, but I wasn't sure. After G2CS, I have solidified my decision to become a computer scientist. I really enjoyed working with computers and other people who do too during the camp and I realized that is what I want to do when I grow up.

After having visited many workplaces through field trips my career path has changed. I have realized that there is more to a computer science career than sitting at a computer desk all day and working. I still do not know what exactly I am going to be when I grow up, however, I have a new vision of the field of what I want to pursue.

Yes, it has given me the opportunity to see and experience what working in the computer science fields are like. When I start to think about jobs I will consider one in computer science.

## Appendix V: Parent Final Evaluation Results by Frequency

**Question 1: What do you think was the most valuable aspect of the camp for your daughter?**

Interested her in the possibility of computer science/STEM fields as a career	23
Made friends with other girls with similar interests	20
Improved her confidence level	11
Seeing women in STEM fields had an impact	3
Robotics	3
Learned that technology can work in combination with creativity and the arts	2
Using public transportation	2
Learned that 'summer school' can be fun	1
Dissecting gadgets	1
Field trips	1
Segway	1
Alice	1
Microsoft	1

**Question 2: Do you remember which activities, lessons or field trips impressed you daughter the most? If so, please list them.**

Microsoft	32
Field trips (all)	19
Intel	11
Flying Rhino	10
Robotics	9
Alice	7
University of Washington	6
Amazon	5
OPB	4
Radia Perlman	3
Vernier/Segway	3
Dissecting gadgets	3
3D	2
Binary numbers	1
Volleyball	1

**Question 3: Please rate the G2CS camp compared to other summer opportunities your daughter has participated in.**

1 Not worth attending	2	3 Good	4	5 Truly Outstanding	Mean
0	0	0	2 (4.3%)	44 (95.7%)	4.96

**Question 4: Please share any other comments or concerns or recommendations you have for future camps.**

**Comments:**

Everything was well-planned; excellent camp	25
Food was nutritional; well-balanced diet	2
Physical activities were well-planned, fun	2
Seattle trip was great	1
Public transportation was a positive experience	1
Career insights were valuable	1

**Recommendations:**

Extend program for campers to return again next year	2
Update the website throughout camp to keep parents informed	1
Add one more day to the Seattle trip	1
Have more field trips	1
Avoid the 4 <sup>th</sup> of July; camp interfered with family plans	1
Have a follow-up weekend reunion	1
Have more variety in food	1
The acceptance letter indicated a packet would be mailed; where was it?	1
Add a parent to the planning team to reassure other parents	1

**Question 5: List at least three goals you have for your daughter as a result of camp.**

Continue learning CS/STEM/problem-solving	28
Keep in touch with new friends from camp	11
Move toward a CS/STEM career	14
Join a Lego robotics team; do a Lego robotics project	7
Continue to gain confidence in order to realize her potential	7
Graduate from high school and college	6
Understand that as a woman there are no limits to what you can accomplish	5
To be an Intern at next year's camp	5
Keep up good grades	3
Seek challenges	3
Enjoy the creative side of CS	2
Make us a family webpage	1
Fix my computer	1

## Appendix VI – ISTE NETS Standards:

### The ISTE NETS and Performance Indicators for Students (NETS•S)

#### 1. Creativity and Innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

Students:

- a. apply existing knowledge to generate new ideas, products, or processes.
- b. create original works as a means of personal or group expression.
- c. use models and simulations to explore complex systems and issues.
- d. identify trends and forecast possibilities.

#### 2. Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

Students:

- a. interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
- b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- c. develop cultural understanding and global awareness by engaging with learners of other cultures.
- d. contribute to project teams to produce original works or solve problems.

#### 3. Research and Information Fluency

Students apply digital tools to gather, evaluate, and use information.

Students:

- a. plan strategies to guide inquiry.
- b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- c. evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
- d. process data and report results.

#### 4. Critical Thinking, Problem Solving, and Decision Making

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

Students:

- a. identify and define authentic problems and significant questions for investigation.
- b. plan and manage activities to develop a solution or complete a project.
- c. collect and analyze data to identify solutions and/or make informed decisions.
- d. use multiple processes and diverse perspectives to explore alternative solutions.

## **5. Digital Citizenship**

Students understand human, cultural and societal issues related to technology and practice legal and ethical behavior.

Students:

- a. advocate and practice safe, legal, and responsible use of information and technology.
- b. exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
- c. demonstrate personal responsibility for lifelong learning.
- d. exhibit leadership for digital citizenship.

## **6. Technology Operations and Concepts**

Students demonstrate a sound understanding of technology concepts, systems, and operations.

Students:

- a. understand and use technology systems.
- b. select and use applications effectively and productively.
- c. troubleshoot systems and applications.
- d. transfer current knowledge to learning of new technologies.

Source:

<http://www.iste.org/standards/nets-for-students>

## Appendix VII – ISTE NETS Standards:

### NETS•T FOR TEACHERS 2008

#### 1. Facilitate and Inspire Student Learning and Creativity

Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments. Teachers:

- a. promote, support, and model creative and innovative thinking and inventiveness.
- b. engage students in exploring real-world issues and solving authentic problems using digital tools and resources.
- c. promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.  
model collaborative knowledge construction by engaging in learning with students,
- d. colleagues, and others in face-to-face and virtual environments.

#### 2. Design and Develop Digital-Age Learning Experiences and Assessments

Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS•S. Teachers:

- a. design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.  
  
develop technology-enriched learning environments that enable all students to pursue
- b. their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.
- c. customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.  
provide students with multiple and varied formative and summative assessments aligned
- d. with content and technology standards and use resulting data to inform learning and teaching.

#### 3. Model Digital-Age Work and Learning

Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society. Teachers:

- a. demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.  
collaborate with students, peers, parents, and community members using digital tools
- b. and resources to support student success and innovation.  
  
communicate relevant information and ideas effectively to students, parents, and peers
- c. using a variety of digital-age media and formats.  
model and facilitate effective use of current and emerging digital tools to locate, analyze,
- d. evaluate, and use information resources to support research and learning.

#### **4. Promote and Model Digital Citizenship and Responsibility**

Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

Teachers:

- a. advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.
- b. address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources.  
promote and model digital etiquette and responsible social interactions related to the use
- c. of technology and information.
- d. develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital-age communication and collaboration tools.

#### **5. Engage in Professional Growth and Leadership**

Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources. Teachers:

- a. participate in local and global learning communities to explore creative applications of technology to improve student learning.
- b. exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.
- c. evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.
- d. contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of their school and community.

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**Source:**

<http://www.iste.org/docs/pdfs/nets-t-standards.pdf?sfvrsn=2>

**Appendix VIII – Pre- and Post-Assessment** (Week 3: repeated at end of week)

Name: \_\_\_\_\_

Please answer the following questions. Leave blank any questions that you don't know the answer to.

What are your favorite subjects in school? (Please circle all that apply)

- a) English
- b) History
- c) Math
- d) Science
- e) Foreign Language
- f) Government
- g) Art
- h) Music
- i) Other: \_\_\_\_\_

During the last week (counting yesterday and backwards 6 days), how often did you use a computer for the following?

- Homework: \_\_\_\_\_ (hours/minutes)
- Social Media: \_\_\_\_\_ (hours/minutes)
- Research: \_\_\_\_\_ (hours/minutes)
- Games: \_\_\_\_\_ (hours/minutes)
- Desktop publishing: \_\_\_\_\_ (hours/minutes)
- Other: \_\_\_\_\_ (hours/minutes)

What do you use computers for?

- a) Only for schoolwork
- b) Mostly for schoolwork and some for fun
- c) About equally for schoolwork and fun
- d) Mostly for fun and some for schoolwork
- e) Only for fun.

Have you ever written a computer program?

- a) Yes
- b) No
- c) Don't know

Have you ever made your own web page?

- a) Yes
- b) No
- c) Don't know



Write the correct name under each picture. Leave blank any that you don't know.



What do the beeps mean as a computer is starting up?

One beep:

---

More than one beep:

---

Which of the following is the decimal number 9 in binary?

- A) 0100
- B) 1001
- C) 1100
- D) 0110
- E) I don't know

Why would you use an <h1> tag in a web page?

- A) To make the text bold,
- B) To emphasize text
- C) To make an ordered list
- D) To make the text large
- E) I don't know

Select true or false for each of the following. Leave blanks if you don't know the answer.

- TRUE/FALSE: Images sent across the Internet are broken up into smaller components called packets.
- TRUE/FALSE: A router is an application on your computer that determines the route your email must take to reach its destination.
- TRUE/FALSE: Microsoft Windows is an example of software.
- TRUE/FALSE: A computer network is a computer that is used by many different people.
- TRUE/FALSE: Hardware is metal, software is plastic.
- TRUE/FALSE: In animation, a sprite on the screen is called "a method".

Computers do a lot of searching, for example, searching for something on Google, or searching for a document on your computer. There are many different search strategies. Describe, using at least one full sentence, a way that a computer might search a directory of 1,000 files to find a particular file.

---

---

In computing, what is the difference between hardware and software?

---

---

---

What is a computer language?

---

---

---

Why do computer scientists write programs?

---

---

---

Circle any of the following words relating to Computer Science that you know. Describe them using a complete sentence.

Boolean:

---

Loop:

---

Object:

---

Method:

---

Action:

---

Function:

---

## **Appendix IX: Interview Protocols**

### Student Interview Protocol:

(To be done each spring via Survey Monkey following participation in the Camp.)

1. What do you remember most from Camp?
2. What skills that you learned in Camp have you been using? What work have you produced recently using the skills that you learned?
3. Are you more aware of women in leadership positions in your school, community, country? Give examples.
4. Are you currently taking any mathematics, science, engineering or technology courses? How do you feel you are performing? Are you using any skills you learned in Camp?
5. Do you consider yourself part of a learning community? In what way? (Do you use social media to maintain communication with G2CS campers or with other students? Describe the learning community.
6. What courses do you plan to take next year?
7. On a scale of 1 to 10, how do you rate your own creativity and imagination? Was this affected in any way by the Camp?

### Teacher Interview Protocol

1. Have you become more aware of women in leadership positions in science and computer science – in your school, community, country? Give examples.
2. Do you feel you are preparing lessons that are more aligned with mathematics, science and/or technology standards than you did before you began work on the Girls Camp project? Give examples.
3. Do you consider yourself part of a learning community? In what way? Describe the learning community.