AVIATION HIGH SCHOOL





WING STRENGTH DESIGN
Student Final Survey

Distributed April 6 & 7, 2006

Name _____ Period _____ Date _____

WING STRENGTH DESIGN

FINAL EVALUATION

SELF

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.	**Overall, I did an outstanding job on the project.** (In particular, think in terms of quality control, variables, testing and lessons learned.)	①	②	③	④	⑤
	Comments:					
2.	**I learned important ideas about engineering and the design process.**	①	②	③	④	⑤
	Comments:					
3.	**I enjoyed the process and project.**	①	②	③	④	⑤
	Comments:					

TEAM

4.	**I worked effectively with my team.**	①	②	③	④	⑤
	Comments:					
5.	**I am satisfied with my team's performance.**	①	②	③	④	⑤
	Comments:					
6.	**I learned useful lessons about team work through this project.**	①	②	③	④	⑤
	Comments:					

	Eliminate	Keep, but with modifications	Keep	Comments
7. Test coupons	①	③	⑤	
8. Team operating agreement	①	③	⑤	
9. Wing design I	①	③	⑤	
10. Testing I	①	③	⑤	
11. Design file I	①	③	⑤	
12. Wing design II	①	③	⑤	
13. Testing II	①	③	⑤	
14. Design file II	①	③	⑤	
15. Wing design III	①	③	⑤	
16. Testing III	①	③	⑤	
17. Design file III	①	③	⑤	
18. Preparing for interviews	①	③	⑤	
19. Interviews	①	③	⑤	
20. Field trip / award ceremony	①	③	⑤	

21. As you think about the project from start to finish,
    a) What was the best part?

    b) What was the most challenging part?

22. If you could do the project over, what would you change?

Question	n=		strongly disagree	disagree	neutral	agree	strongly agree
1	81	I did outstanding job	1%	6%	20%	51%	22%
2	82	learned about engineering and design	1%	1%	10%	32%	56%
3	81	enjoyed process and product	1%	1%	15%	33%	49%
4	81	worked well w/ team	1%	6%	23%	42%	27%
5	82	satisfied with team performance	2%	6%	18%	34%	39%
6	82	useful lessons about team work	1%	5%	17%	33%	44%

			eliminate	keep with changes	keep
7	79	test coupons	19%	35%	46%
8	80	operating agreement	4%	23%	74%
9	82	wing design 1	4%	15%	82%
10	82	testing 1	1%	16%	83%
11	82	design file 1	10%	13%	77%
12	82	wing design II	1%	11%	88%
13	82	testing II	1%	11%	88%
14	82	design file II	11%	13%	76%
15	82	wing design III	0%	13%	87%
16	82	testing III	0%	12%	88%
17	81	design file III	2%	12%	85%
18	82	prep for interview	4%	22%	74%
19	82	interviews	7%	11%	82%
20	80	field trip	1%	20%	79%

What was the best part?

- seeing our wing design improve the last test definitely the most exciting
- working with each other
- The best part was after we broke / tested a wing and designed a new wing with new features hoping it withstands more weight
- The best part was the interview
- the best part was getting feedback on what we could improve / and the awards
- building the wing
- I really liked the field trip and the interviews
- being left along to work on it without teacher assistance
- the testing
- the design process
- experimenting with different designs and seeing how our wings did on the test
- designing the wings to be constructed
- building the structures
- building the wings and testing tem
- building the wings
- testing 3rd round wings
- The best part was the wing testing
- building the wings
- finding a group to work with
- I liked making the wings
- testing the wings
- building it
- building the wings with my group. We had a lot of fun and learned a lot from each other
- testing
- the second wing test
- building the wings and having interviews
- the building
- building the wings
- being able to do what engineers do, but on a small scale
- testing of the wing
- testing days, because you finally get to see how well the wing did
- building the wings
- wing testing
- building the wing
- I liked the final test. It was really exciting
- building
- the test day was the best
- the best part was the interviews, because I actually passed on that. It was fun too
- testing the wings; it's always fun to watch things break
- thinking and testing
- when Derek sat on a wing and got lifted up by it, and it survived
- breaking stuff
- building the wings
- testing the wings
- testing the wings
- I think the 3rd round was the best part b/c everything got a lot better (i.e., designs, testing, design files)
- the entire thing was great
- building the wings
- wing testing
- the field trip
- building the wings
- start
- testing
- designing, building and testing were equally the best part because they were equally important
- making and testing the wings
- testing
- testing 3 because you can see the changes from what I've done and the improvement
- none
- working on the wing
- building and testing the wings
- testing
- seeing how wings performed
- interviews
- first round, showed who knew something about wing designing / building
- when we tested wing Z (my wing)
- building the wings
- I loved making the wings I think it was the best part
- the final design process
- making designs you thought of come to life and seeing how they hold up
- making the wing
- building the wings
- getting $20
- building the wings
- picking groups and building
- I enjoyed making the wing
- testing the wings
- getting the awards for the best wing
- the building / design process for each wing
- building the wing and getting to test it
- testing the wings
- actually building the wing after figuring out our design, and during the interviews
- building the shell of the wing

What was the most challenging part?

- team work, communication and getting each others word and input in
- working with each other
- the design file, it was hard but was a real relief when we finished. It was a learning experience
- The most challenging part was the interview
- design file
- getting data
- getting team cooperating
- not begin shown at all how to build nor given information how
- design file
- interview
- making the wing exact to the design
- constructing the wings, time was limited
- design file set-up
- documenting the design / building process
- the interview
- making the first round wings
- The most challenging part was probably the design file
- engineer interview
- I had a partner who was not there
- the design files
- the design file
- getting the confusing formulas and equations
- making the 3 design files. I think we should have organized a little better
- making the shell
- the final building process and preparing for interviews
- testing the wing and design file
- the interviews
- design file
- the interviews
- presenting to the engineers and working with time constraints
- building the small supports and waiting for things to dry
- testing
- time limit
- calculating the numbers
- Making a design light and strong. Thinking of a design was very challenging alone
- making a web page because I have never done it before
- finding a design that will work the best
- The most challenging part was the testing. The formulas, the math part, and all that confused me. The design was hard too, because you had to really consider what variables would help strengthen your wing and know what variables might weaken your wing
- the interview for the public speaking
- thinking
- dealing with Max
- design file
- the design file
- keeping quality control when building the wings
- building the wings
- the most challenging part was getting the design file done
- getting my team to work
- design file III
- design file
- interviews made me nervous
- getting the wings off the wood
- having to work so fast
- design file
- working with group members
- staying on task; first design file; working on wings at home
- design file
- wing design 3 because I had to think
- interviews; design file
- time we had to make wings
- coming up with the wing design file
- build the structure
- data taking
- thinking of design
- constructing the wings
- the design files
- finding out what would work
- the interviews
- getting the design files finished
- getting the group to work
- time!!! X _ X
- building the wings
- think of effective designs
- making the design files
- getting & working well with my teammate
- making the supports
- the interviews
- design files
- design file
- It was to make the wing
- building the wings
- things to figure out what went wrong and why the wing didn't work
- designing the wing to be light and efficient

What would you change?

- I would communicate with my team members better
- time… I think we need more time
- I would get a quicker start so I would have more time. Not delay the wing or design file. Time is a valuable necessity
- I would do quality, not quantity control
- different materials
- making the wing stronger
- not to be rude, but I'd change my team; I would also work harder and communicate more
- the amount of testing, the core ideas, researching and development
- how I built the wing
- change the initial design because we can start with a good wing in the beginning and end with a great one
- I would change my time put into the wing, I would put more time into my wings
- amount of formal tests and design file; more tests would have led to better wings
- the time limit on the building process
- I would remember to take pictures of every aspect of the wing building
- I would work harder on building a strong design
- cut down on wing weight by a lot
- I would be more organized and not procrastinate
- a fourth wing test
- I would want more time
- I would change the design of my wing
- I would change my overall wing design to a more hollow design
- building another wing
- having two wings and spending more time on each of them
- stricter timeline
- one more test and more data recording
- wing designs and thinking
- more time
- I would change the design I used I would also the amount of trials we did; you should have done one more after the interview
- eliminate test coupons and use that time for building
- more time to build wings
- do a 4th wing
- I think the wings should be tested on compressing and bending, not just bending
- focus more on quality control
- I wouldn't do 3 wings at the beginning. Now I have better idea of what works and so I would have 3 different designs throughout the 3 testing periods
- I would focus on only one design instead of 3 for the first round of testing
- change job positions
- I would add on to our design
- next time, maybe go over the testing part with the class so they know it like the back of their hand. There are some kids out there who are afraid to ask questions, so just explain it to them. Overall, it was a great project and I learned many things.
- working more the design file; spending more time building the wings
- I would keep my designs secret :-)
- find a different group or more time or different materials or different materials
- nothing
- our design
- I would allow more time for building wings; tell everyone there's a prize for best wing from the start
- time evaluation
- I would change some of the material selections
- nothing; it was great fun! Thanks for allowing me the experience.
- amount of time and more wings
- nothing
- choose teams at random; divvy up work better
- the design of my wing and the amount of time you have
- different group
- probably the group I was in because it didn't go to well
- nothing, I loved it
- more materials to diversify it, make more designs, simulate life more, make it more fun
- not as many design files
- the weight of wing so I can get more efficiency
- let the wing dry
- time to build wings
- nothing
- wing design file
- don't be test engineer; very hard!
- I would not change anything because I am satisfied with my design
- my designs… they weren't that great
- work distribution
- no design files

- I would change my first and second design and the way I did the design files. But I wouldn't change my team members
- the quality control on the wings
- I don't know
- TIME!!!
- the way I built the wings
- 2 spars on the outside
- I wouldn't procrastinate and change all our design files
- nothing! :-)
- I would allow more time to create the wing
- the wing design
- no teams
- my group members
- I would work more and I would make more wings and do better
- I would change the length of time working on the wing
- I would use my time more wisely
- time allotted to design and create wing

Question	n=		strongly disagree	disagree	neutral	agree	strongly agree
1	81	I did outstanding job	1%	6%	20%	51%	22%

- I do agree, but I do think we could have done used more time, and maybe another trial or two
- On the first 2 wings, I didn't try as hard as I could but by our final wing, we were cookin'. We improved A LOT!
- GREAT PROJECT
- I learned a lot during this project (more than I knew before)
- I am not personally too fond of planes, so self-interest affected me
- I thought I did absolutely fabulous, but in comparison to others it does not appear so
- I liked the fact that we had outstanding improvement
- don't remember
- I could have done more 'serious' thinking
- everything was fine and planned well. Nice job, Mr. McComb [and Mr. Grose]
- we would spend more time making better wing next time
- I put a lot of effort into this project and that's all that really matters to me
- I improved on my team work skills
- obviously could have done better
- I worked hard on building, the design and design file
- needed more time control
- it didn't help much
- all right, but not best wing
- I was able to do my part as a project manager
- I really didn't do much
- I learned to rely on myself and that I can do design files and work well by myself
- a truly outstanding project that was well-planned and thought-through. It was a lot of fun.
- I think I did well, but not outstanding
- having due dates helped but if we had some more time it would have gone better
- we didn't have enough time
- I could have done better
- I tried and put effort in and learned

Question	n=		strongly disagree	disagree	neutral	agree	strongly agree
2	82	learned about engineering and design	1%	1%	10%	32%	56%

- I learned how to improve my wing using failures that we had in the 1st round
- I now have a solid basis to begin my engineering career
- I learned how what we do relates to engineers
- I learned some of the terms and concepts real engineers use, but I think it should require more thinking and less building
- more rules and regulations
- even though most of the time we were socializing and goofing off, I actually learned a lot
- I learned a lot from different designs
- learned about wings
- calculating efficiency
- I never did any sort of thing with engineering so it helped
- My dad's an engineer, so yeah
- I wish I would have chosen a team that stuck together and worked better so that I didn't get stuck with all the work
- there are many terms and procedures I learned in engineering
- I learned how you build a wing and how it all works

Question	n=		strongly disagree	disagree	neutral	agree	strongly agree

3	81	enjoyed process and product	1%	1%	15%	33%	49%

- loved the paper mache
- the project was challenging to the point I did not what to research and when I did very knowledge existed on it
- LOVED IT
- I think we should have a round for making the best shell
- this was a fun project
- we needed more time to build or fewer other assignments to do while we build
- truly fun… want to do more rounds
- This was a really fun & fantastic project
- it was fun to build the wing
- I enjoyed building the wings
- It was okay building the wings, but hard on design file
- only one wing instead of three
- very fun
- building is fun
- the project was fun
- good project, but the group I was in kind of ruined it
- I wish our wing did better
- I could have had a harder-working group
- the length of it
- a long process yet fun
- I liked this project and I think that we should do this project again

Question	n=		strongly disagree	disagree	neutral	agree	strongly agree
4	81	worked well w/ team	1%	6%	23%	42%	27%

- we had difficulty at first but then we learned how to get along
- teammates were hard to work with but I guess not adapting is my fault
- yeah, I worked well, we all get A's on our design files got it turned in on time, performed well together, no problem
- most of the time
- my team did have a few problems and we worked well to solve issues but I think we should have had more group meetings
- There were times when we had a little trouble, but overall we did well.
- when I got with my new team, we got along perfectly
- our team was a really good team
- I loved working with my team! :-)
- got all work done
- constant contact
- it was hard to communicate outside
- hah! Funny!
- not really, my team wasn't that hard working after Ana left
- distribute work evenly
- I could have worked better with the team

Question	n=		strongly disagree	disagree	neutral	agree	strongly agree
5	82	satisfied with team performance	2%	6%	18%	34%	39%

- in the end every one worked well
- I believe this project had much more potential than we demonstrated
- my team performed better than what I was hoping for
- 400% improvement
- my team and did our best
- we did an outstanding job on the interviews
- We did well.
- a bit lazy
- we worked hard
- I think we did really well
- could have had better wings
- the web page was amazing because I have never such things
- we did great at the end
- we passed
- yes people were telling others not to work and not to do a lot
- I think it could have been better with teamwork

Question	n=		strongly disagree	disagree	neutral	agree	strongly agree
6	82	useful lessons about team work	1%	5%	17%	33%	44%

- I learned to speak (communicate) with everyone in my group in order to have a good group
- we will all need to deal with bad situations sooner or later. As project manager, I need to calibrate more, looking forward to demonstrating on the next project.
- I learned: how to cooperate in a long-term project, develop ideas out of thing air, real designing, and best of all, learned how to take advantage of individual strengths and weakness in benefit of the project
- how to bring people together
- I know now how to combine how work to make a great wing
- I learned a lot
- time management
- my classmates are super geniuses
- My group leader was terrible… or I'm a terrible group member
- no
- I could not learn anything about teamwork from my group
- sometimes teammates wouldn't do work
- I learned how to work better
- It is hard when your team is against you

Question	n=		eliminate	keep with changes	keep
7	79	test coupons	19%	35%	46%

- gives ideas
- was not essentially needed in the design process
- this worked, but…
- good but not necessary
- change the testing way?
- good idea for warm-up
- ability to use tape sparingly
- didn't really apply- vertical stress, wings were horizontal
- show some first
- I thought it was really fun
- didn't help much
- what?
- make it more like the project
- I didn't get the purpose
- a few more days to test

Question	n=		eliminate	keep with changes	keep
8	80	operating agreement	4%	23%	74%

- helps, also allows you to fire / hire… both good ideas
- team members need to be responsible
- we had a good design; we just needed to make the design stronger
- just in case a "for worse" situation occurs
- modify for teams of two
- don't have as many strikes
- make sure team complies
- shorter
- no one really followed it; it was a waste of time

Question	n=		eliminate	keep with changes	keep
9	82	wing design 1	4%	15%	82%

- It's all a learning process, we need to build the wings and write about it. That's how we learn and get better
- more time
- 1 wing, not 3
- helped us start
- more time to build
- only one wing

Question	n=		eliminate	keep with changes	keep
10	82	testing 1	1%	16%	83%

- make sure people know what they are doing
- helpful tips given
- more accurate testing
- we don't need it

Question	n=		eliminate	keep with changes	keep
11	82	design file 1	10%	13%	77%

- show some first
- remind people to save data from all tests
- collect data pictures, quantitative and qualitative observations

Question	n=		eliminate	keep with changes	keep
12	82	wing design II	1%	11%	88%

- introduce methods & designs useful in making a strong wing
- helped improve
- more time to build
- it didn't do a good job when we on testing (process-horrible)

Question	n=		eliminate	keep with changes	keep
13	82	testing II	1%	11%	88%

- didn't hold any water

Question	n=		eliminate	keep with changes	keep
14	82	design file II	11%	13%	76%

- we don't need it

Question	n=		eliminate	keep with changes	keep
15	82	wing design III	0%	13%	87%

- more time!
- more time to create
- got to show our best, so it was great
- more time to build

Question	n=		eliminate	keep with changes	keep
16	82	testing III	0%	12%	88%

- more time!

Question	n=		eliminate	keep with changes	keep
17	81	design file III	2%	12%	85%

- maybe focus more on last design
- too hard
- summary of design 1, 2 and 3

Question	n=		eliminate	keep with changes	keep
18	82	prep for interview	4%	22%	74%

- business cards are professional but no one's really going to call
- we were all prepared
- not so many points riding on it
- mock interviews
- okay
- have practice interviews in class
- little more time
- more time
- make sure everyone has equal time
- helped with speech and appearance
- have a longer time to prepare
- scary but I thought it was fun

Question	n=		eliminate	keep with changes	keep
19	82	interviews	7%	11%	82%

- Perfect! It's great to talk about our experience
- we all spoke well
- I was nervous
- a fun challenge
- longer time for interviews
- more time?
- a good way to end our project

Question	n=		eliminate	keep with changes	keep
20	80	field trip	1%	20%	79%

- a privilege!
- I didn't like the people who won; I think they won by pure luck
- have the engineers demonstrate theirs
- no prize or cash prize; students should be self-motivated
- really enjoyed it
- I really enjoyed the field trip
- yes! Field trip
- make it longer
- have them spread out over a few days so if someone is sick they can go on a different day
- field trip before the project; better idea of what we're working at
- fun and interesting
- didn't go but would have been cool
- great!
- too short though
- a longer field trip
- make this longer
- a great field trip!