

## Previous Design Projects

1. Optimization of CPU heat sink in cross-flow (OptdesX software was used)
2. The toaster (How much of the total heat is absorbed by the bread and how much is lost out of the toaster? Out of 900W emitted only 392.5 W reaches the bread. Almost 500 W is lost to radiation and convection out of the toaster).
3. An Experiment in Insulated lunch bag (comparison of 2 lunch bags).
4. Investigation of contact thermal resistance (what effect if any, increased pressure would have on heat transfer between two brass pieces; for second experiment, heat transfer compound).
- 4b. Thermal resistance of adhesives (experimental comparison of the fastening resistance of JB Weld and a mechanical mounting for BYU Micro Air Vehicle team).
5. Eigenfunction expansion of the heat equation for an insulated cylinder that is axisymmetric.
6. Aluminum foil solar heater. (Heating water through the solar radiation with the aid of a reflective material (tin foil).
7. Convection coefficient of a stream of water out of a shower head.
8. An orange's transient temperature response. (Comparison of lumped capacitance and approximate method with experiment).
9. An analysis of the amount of energy required to keep an Olympic size hockey rink frozen. (Size: 1579 m<sup>2</sup>; 568 kW).
- 9b. Heating an ice arena (use of radiation for heating seat stands)
10. Energy efficient home.(comparison of efficiency and cost of 2x4 and 2x6 studs with insulation).
11. The coefficient of conduction of rubber compound (used to cast chocolate candy)
12. Thermal analysis computation comparison (comparison of Pro-Mechanica with experiment).
13. Conduction of Nalgene bottle in a sleeping bag.
14. Finite Element analysis of sauce pan handle (Pro-Engineer (Mechanica))
15. The transfer of heat from material to tool in friction stir welding.
16. Conductive heat loss calculator for a room.
17. Building material comparison
18. Heat exchanger improvement project (the new design should allow for sufficient heat transfer between the exhaust gases and the incoming air to prevent carburetor icing during landing conditions)
19. Conventional ovens versus convection ovens (concluded that convection oven is able to heat the inside of food much faster while keeping the surface of the food closer to the same temperature).
20. Transient heat transfer for grapefruit and orange.
21. A brief comparison of strict application of Newton's Law of cooling and FEA modeling of airfoil heat transfer.
22. Evaluation of heated rods

23. Comparison of measured to calculated times: the transient response of an orange.
24. Modeling the effect of an insulated oxide-layer on friction stir welding of Ti-CP (Fluent used)
25. Cooling effect on an apple placed in a refrigerator.
26. Heat transfer analysis of a convective heater.
27. Experimental verification of Stefan-Boltzmann Law.
28. Cost and heat transfer analysis of exterior home walls.
29. Design of a solar water heater.
30. Temperature Change of Water in Aluminum Can under Free Convection.
31. Comparative Engine Heat Generation Analysis.
32. Heat loss through a large living room window.
33. Heat generation in a Mini Baja vehicle drive train.
34. Thermal resistance comparison.
35. Temperature change of cooling fluid in a power transmitting copper tube.
36. ProE thermal analysis of brake rotors.
37. Designing for heat in digital light projectors (investigation to find useful design principles).
38. A Heat Transfer Investigation of Sleeping Bags
39. Heat Loss in a Room.
40. Thermophysical properties calculator.
41. Analysis of Nusselt Number correlations for a circular cylinder in laminar cross flow.
42. Predicting conduction and convection coefficients of a thermos.
43. Out of the fire and into the frying pan (heat transfer characteristics of different types of pans).
44. Cooler losing its coolness
45. Oven convective heat transfer coefficient.
46. Determining the thermal conductivity of synthetic diamond.
47. How many bullets can be fired before the barrel of the M38 rifle begins to deteriorate?
48. Ice cream scoop heat transfer project.
49. Sunroom design problem.
50. Optimization of heavy oil transportation.
51. Slip 'N Slide heat transfer.