

DESIGN OF EXPERIMENTS CLASS LIST OF EXPERIMENTS

#	RESPONSE	FACTORS TESTED AND/OR COMMENTS
1	boiling cream soup	pan type (ALCU), stir (constant intervals), milk(all intervals)
2	likelihood for injury	training (yes,no), safety devices (yes,not, emotional (ok,bad)
3	cookie baking time	pan type (ss, teflon), butter (only oil), dough temp (cold room)
4	pool no scratching	stick type, English, hit (hard soft)
5	shoot arrow 300 yards	#strands, release (hand, mechanical), arrow (wood, AL)
6	dart throwing	foot position, eyes (one, two), wt (heavy, light)
7	moisture test (new vs. STD)	sample size, time, dispersion
8	moisture variation test	Tester, temp, time, sample size
9	playdough (elasticity)	sub ingredients, vary ingredients, method of cook
10	count paper breaks	Vendor, paper, wt, order
11	accuracy w/22	sights, support, ammunition
12	machining threads	operator, shift, quantity
13	gluing of paper	Nozzle, pressure, type
14	curl of tables	heat, lamps, speed
15	length of cores	core, speed, feed
16	optimize fold	blower bar, sheet gap, plate order
17	optimize roller hardness	torque, tension, braking
18	bowling	ball, wt release, strt pt, position
19	microwave results	time, voltage 1, voltage 2, cheese temp
20	baking potatoes	size, cover, elevate, slice
21	boiling H2O	cover (no, yes), pan (iron, CU), salt (no, yes)
22	pellet shooting	eye (left, right), #pumps, distance, stance
23	finish on propeller	cob, meal (old, new), de-foaming (A,B)
24	stretch fabric test	fabric type, thread type, stitch length, stitch type
25	boiling water	amount, burner size, water temp
26	wood splitting	nail type, wood type, thickness, length
27	clothes washing	H2O temp, soap type, softener, bleach
28	pellet shooting	position, #pumps, distance, time
29	golf ball drop	brand, temp, type
30	torque gun test	gun pressure, lube, extension
31	gear case test	Machine, casting, clamping
32	drive shaft finish	tooling, coolant, speed
33	rifle shooting	bullets, scope, position
34	bake potato	Moisture, perforation, thickness
35	yarn placement	Guide, fringe, washer
36	optimize grinding	Diameter, size, angle
37	bowling	wt, speed, spin
38	soldering	air temp, speed, inert gas
39	pistol	hand (left, right), stance, distance
40	water boiling	pan (all stainless steel) amount, salt, cover (yes, no)
41	gas mileage	gas type, speed, driver
42	rifle shooting	Position, stance, target position
43	basketball	ball size, basket height, type of shot, hands (1,2)
44	fishing	bait???
45	design coffee pot	thermostat, grease, element
46	arrow shooting	shaft, wt, release, fletching

List of some studies done by students in an experimental design course

#	RESPONSE	FACTORS TESTED AND/OR COMMENTS
1	time to complete fixed course on bicycle and pulse rate at finish	seat height (26,30inches), generator (on,off), tire pressure(40,55 psi)
2	yield of popcorn	brand of popcorn(ordinary, gourmet), size of batch (1/3,2/3,cup), popcorn to oil ratio (low, height)
3	quality of bread, especially the total rise	temperature and amount of sugar, liquid (milk, water), size temperature, rise time
4	how well twins who had colds, slept during the night	number of pills, amount of cough syrup, use of vaporizer
5	quality of slides made close up with flash attachment on camera	speed of film, light (normal, diffused), shutter, speed
6	growth rate of algae in salt water aquarium	hours of illumination, water temperature, specific gravity of water
7	taste of Kool-Aid	temperature, amount of sugar, food prior to drink (water, salted popcorn)
8	strength of radio signal from particular AM station in Chicago	direction in which radio is facing, antenna angel, antenna slant
9	blending time for soy beans	blending speed, amount of water, temperature of water, soaking time before blending
10	operation time for pocket calculator	charge time, digital fixed, number of calculations performed
11	time until dryer stops	clothes dryer (A,B), temperature setting, load
12	time to boil water	pan (aluminum, iron), burner on stove, cover for pan (no, yes)
13	hours of relief from migraine headache	aspirin buffered (yes,no), dose, water temperature
14	taste comparison of homemade yogurt and commercial brand	amount of milk powder added to milk, heating temperature incubation temperature
15	time required to run up steps and heartbeat at top	pack on back (no,yes), footwear (tennis shoes, boots),run (7,14 flights of steps)
16	length of flight of model airplane	width to height ratio of sheet of balsa wood, slant angle, dihedral angle, weight added, thickness of wood
17	how much coffee spilled while walking	level of coffee in cup, devices (nothing, spoon placed across top of cup facing up), speed of walking
18	cost of knitting scarf, dollars per square foot	type of stitch, yarn gauge, needle size
19	time to get steel ball through a maze	type of drink (beer rum), number of drinks, rate of drinking, hours after last meal
20	cost of order of French fries, in center per ounce	size of order, time of day, sex of server
21	gas mileage for car	brand of gas, driving speed, temperature
22	number of days required for letter to be delivered to another city	Stamp (first class, airmail), zip code (used, not used), time of day when letter is mailed.
23	Length of whiskers 3 days after shaving	side of face (left, right), beard history (shaved once in two years-sideburns, shaved over 600 times in two years just below sideburns)
24	Number of times (out of 15) that correct gender of passerby was determined by experimenter with poor eyesight wearing no glasses	eyes used (both, right), location of observer, distance
25	number of shot that penetrated a one foot diameter circle on the target	distance to target, guns (A,B), powders (C,D)

26	Height of cake	oven temperature, length of heating, amount of water
27	density of photographic film	strength of developer, temperature, degree of agitation
28	length of rubber band before it broke	Brand of rubber band, size, temperature
29	speed of H.O scale slot racers	Viscosity of oil, type of pick-up shoes, number of teeth in gear
30	time for car to cover one-quarter mile	type of tire, brand of gas, driver (A,B)
31	time to dissolve table salt	Temperature, stirring rate, amount of solvent
32	taste of stewed chicken	amount of cooking wine, oyster sauce, sesame oil
33	angle necessary to make object slide	Type of surface, object (slide rule, ruler, silver dollar), pushed? (no, yes)
34	number of kicks necessary to start motorcycle	ambient temperature, choke setting, number of charges
35	time to bake biscuits	temperature, location in oven, biscuits covered while baking (no,yes)
36	quantity of suds produced in kitchen blender	temperature of water, amount of grease, amount of water
37	toys child chose to sleep with	person putting daughter to bed (mother, father), bed time, place (home, grandparents)
38	correct answers on simple arithmetic test time required to complete test, words remembered (from list of 15)	amount of light in room, type of music played, volume
39	bite, smoking characteristics, aroma, and taste of tobacco mixture	amounts of adder Turkish, Latakia, and Perique tobaccos
40	time to melt ice	temperature, humidity, rock salt
41	points in games of sheephead, a card game	number of cards dealt at one time, position of picker relative to the dealer
42	pleasure experienced in subsequent sexual intercourse	marijuana (no, yes), tequila (no, use), sauna (no, yes)
43	taste of pancakes, consensus of group of four living together	amounts of flour, eggs, milk
44	time to get sunburned	brand of suntan lotion, altitude, skier
45	soundness of sleep, average from 5 persons	Amount of sleep the night before, substantial exercise, during the day?(no,yes), eat right before going to bed?
46	clearness and quality of sound and absence of noise	Brand of tape deck used for playing music, bass level, treble level, synthesizer? (no, yes)
47	time to filter	type of filter paper, beverage to be filtered, volume of beverage
48	time to go down ski slope	type of ski, temperature, type of wax
49	four quality characteristics of pizza	ambient temperature for dough when rising, amount of vegetable oil, number of onions
50	time for seeds to germinate	amount of fertilizer, location of seeds (3x3 Latin square)
51	quality of ground malt for brewing beer	speed of kitchen blender, batch size of malt, blending time
52	taste of drink form paper cup	soft drink (A,B) container (can bottle) sugar free?
53	number of swings and duration of these swings obtained from an automatic infant swing	child's weight (13, 22 pounds), spring tension (4, 8 cranks), swing orientation (level, tilted)
54	distance football was kicked	orientation of football, kick (ordinary, soccer style), steps taken before kick, shoe (soft, hard)
55	bowling pin knocked down	weight of bowling ball, spin, bowling lane (A, B)
56	number of shots made (out of 10) with basketball	distance from basket, type of shot, location on floor
57	amount of foam produced when pouring soft drink into glass	temperature, position of glass when pouring soft drink, amount of sugar added
58	strength of bond between two strips of aluminum	brand of epoxy glue, ratio of hardener to resin, thickness of application, smoothness of surface, curing time
59	root lengths of cuttings from purple	amount of plant hormone, water (direct from tap, stood out for 24

	passion vine after 21 days	hours), window in which plant was put
60	ability to remove oil and grape juice stains	amount of detergent (1/4, 1/2 cup), bleach (none, 1 cup), fabric softener (not used, used)
61	time to cook Chinese meal dumpling	skin thickness, water temperature, amount of salt
62	time to get a ride hitchhiking and number of cars that passed before getting a ride	appearance (with and without a crutch), location, time
63	growth rate of house plants	frequency of watering plants, use of plant food (no, yes), temperature of water
64	reproducibility of automatic dilutor, optical density readings made with spectrophotometer	plunger A up (slow, fast), plunger A down, (slow, fast), plunger B up (slow, fast), plunger B down (slow, fast)
65	size of unwanted droplet	Temperature of gas chromatograph column, tube type (UI), voltage
66	strength of polypropylene weld, manual operation	temperature, gas pressure, welding speed
67	rate of chemical reaction	Concentration of lysozyme, pH, ionic strength, temperature
68	length of time fuse powder burned and the evenness of burning	Anhydrous barium peroxide powder, sulfur, charcoal dust
69	time to dry wild rice	Air velocity, air temperature, rice bed depth
70	spreadibility of caramel candy	Concentration of lactose crystal, crystal size, rate of agitation
71	number of particles caught in a fluidized bed collector	Positions of coating chamber, distribution plate, and lower chamber
72	sensitivity of a pneumatic valve control system for a heat exchanger	Proportional band, manual reset, regulator pressure
73	degree of separation of zinc from copper accomplished by extraction	Chloride concentration, phase ration, total amine concentration, amount of preservative added
74	measured nitrate concentration in sewage, comparison of three different methods	Temperature, nitrate concentration, amount of preservative added
75	efficiency of solar space-heating system, a computer simulation	Solar radiation collector, size, ration of storage capacity to collector size, extent of short-term intermittency of radiation, average daily radiation on three successive days
76	extent of corrosion of iron	PH, dissolved oxygen content of water, temperature
77	measurement of butterfat content of milke	Amount of sulfuric acid, time of shaking milk-acid mixture, time of final tempering
78	time to complete job on computer	Mode (batch, time-sharing), job size, system utilization (low, high)
79	two difference measures of efficiency of operation of gas chromatograph	Flow rate of carrier gas, polarity of stationary liquid phase, temperature
80	measured cortisol level in human blood plasma	PH of assay buffer, incubation time, concentration of binder
81	extent of rock candy fracture of cast steel	aluminum, boron, cooling time
82	measurement of angle with photogrammetric instrument	Magnification, read out system (micrometer, electronic), stage light
83	changes in height, width, and length dimensions of cast metal	Riser height, mold hardness, carbon equivalent
84	quality of weld made by submerged arc welding process	Amperage, contact tube height, travel speed, edge preparation
85	recovery of material by steam distillation	Time, amount of magnesium oxide, amount of alloy
86	final moisture content of alfalfa protein	PH, depth, time
87	odor produced by material isolated form decaying manure, after treatment	Deodorant, concentration of chemical, incubation time
88	limiting currents of totaling disk electrode	Temperature variation, concentration of cupric sulfate, concentration of sulfuric acid
89	measured temperature of a heated plate	Air flow, diameter of bead, heat shield (no, yes)
90		

91	efficiency of vacuum filtration of sludge	Pressure, amount of ferric chloride added, amount of lime added
92	longitudinal and thrust forces for surface grinding operation	Longitudinal feed rate, transverse feed rate, depth of cut
93	chemical oxygen demand of samples with same amount of waste (acetamide)	Time between preparation of sample and refluxing, reflux time, time between end of reflux and start of filtering
94	torque of taper roller bearings	Speed of rotation, thrust load, method of lubrication
95	absorption characteristics of activated carbon used with municipal waste water	Type of activated carbon, amount of carbon, pH
96	impact strength strength of steel alloy	Amounts of nickel, manganese, carbon
97	percentage of panelists correctly identifying which samples were lamb	Form (broth, gravy), added broth (no, yes), added fat (no, yes), type of meat (lamb, beef)
98	methane concentration in completed sanitary landfill	Well (A, B), depth of probe, method of analysis (peak height, plantmeter)
99	electrocardiogram reading	Paste (A, B), preparation of skin (no, yes), site (sternum, forearm)
100	removal of turbidity and hardness from water	Lime dosage, time of flocculation, mixing speed
101	mixing time for an initially thermally stratified tank of water	Temperature difference between surface and bottom waters, thickness of surface layer, jet distance to thermocline, velocity of jet, temperature difference between jet and bottom waters