

Data and Chance CTY Course Syllabus

Day	When	Goals <i>Students Will Be Able To:</i>	Activities
1	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Demonstrate the importance of establishing and controlling units of measure 2. Distinguish fair random number generators from biased number generators 3. Classify characteristics of objects and people using a Venn diagram 4. Distinguish forced answer survey as a form of quantified data collection 5. Demonstrate collection of numerated data 6. State course goals 7. Distinguish logic from chance guessing 8. Demonstrate rules of proportion	1. Use two 3x5 cards to point out the importance of the consistency of units of measure 2. Home made dice vs. store-bought 3. Bottle activity and "Get to Know You" using Venn diagrams 4. Take learning style survey 5. Serpentine Wall activity 6. Course Goals 7. Flawed Penny problem 8. Bob & Ted's Big Adventure
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
2	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Distinguish mental math from estimation and paper/pencil method from "showing work" 2. Demonstrate elements of scale 3. Classify scale by applying elements of size and distance to one model 4. Classify relationships by creating a diagram 5. Classify theoretical probability resulting from dice games	1. Meet Moe or Les and Marge and work out examples of how each numerates data. 2. Make a scale from 0-1 billion 3. Scaling the solar system 4. Diagram I'm My Own Grandpa 5. Analyze Dice/Skunk and Roller Derby ice
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
3	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Demonstrate indirect counting method 2. Demonstrate circle graph creation 3. Generate a formula for determining the number of interactions based on the number of participants 4. Distinguish discrete problem 5. Describe rules of blackjack	1. Capture/Recapture activity 2. Favorite gum color (survey) 3. Handshake Problem 4. Line Segment Road Trip 5. Blackjack
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		

Day	When	Goals <i>Students Will Be Able To:</i>	Activities
4	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Describe standard variety of graphs and data sources in the media 2. Classify the ratio of Pi by direct measurement 3. and Buffon's needle problem 4. Classify elements of probability confidence 5. Demonstrate rules for set central tendency 6. Execute the building of a working spinner & classify expected value 7. Describe a career that utilizes chance and data	1. Share and discuss graphs found in current newspaper 2. "Origin of Pi" Demo 3. Pi By Chance (applet available http://www.mste.uiuc.edu/reese/buffon/bufjava.html) 4. Compare Kearns vs. Jordan data 5. Mean, Median, Mode, & Range 6. Make a spinner activity 7. Actuary Article
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
5	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Demonstrate rules for relative frequency 2. Demonstrate proportion by converting number of gumballs to inches 3. Show the procedure of creating a box & whisker plot from a given set of data 4. Generate original data, demonstrate rules for making graphs, & discriminate between use of line graphs and double bar graphs from the same set of data 5. Classify Newcomb's paradox by using expected value 6. Describe rules of poker 7. Generate strategies based on probability 8. Solve mystery by determining necessary data	1. M & M packet activity 2. Yard of bubblegum activity 3. Box & Whisker Plot 4. Gather student baseline, exercising, and recovery heart rates & Organize heart rate data 5. Newcomb's Paradox 6. Poker rules 7. Yahtzee 8. Crime Scene Activity 9. Review various dice outcomes
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
6	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Demonstrate fundamental counting principle 2. Adopt a variety of data gathering procedures by creating complete a brick wall design proposal 3. Demonstrate standard deviation 4. Generate strategies based on probability in a new setting 5. Adopt criteria for evaluating scatter plot data	1. FCP activity 2. Brick Wall Proposal activity 3. Standard Deviation 4. Shanthini's Box 5. Box & Whisker Plots 6. Scatter plot (arm span/height)
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		

Day	When	Goals <i>Students Will Be Able To:</i>	Activities
7	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Continue wall design activity 2. Generate a Likert scale by writing questions, delivering to camp population, & analyze results 3. Classify Benford's law 4. Adopt strategy for documenting ancestors by converting tree chart to a binary system of counting	1. Complete Wall presentations 2. Likert scale survey on topic of students interest 3. Looking out for No. 1 (http://www.rexswain.com/benford.html) 4. Ahnentafel Numbers
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
8	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Demonstrate conditional probability by analyzing classic Monty Hall problem 2. Solve problem of mystery marble boxes by using experimental probability & distinguish from descriptive data collection by describing the contents of a fourth mystery box using blind touch. 3. Demonstrate limitation of expected value by considering theoretically infinite payoff	1. Monty Hall problem activity 2. Four mystery box activity 3. St. Petersburg Paradox activity
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
9	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Classify relevant data and adopt strategies to identify data that is not pertinent 2. Classify fallacies & originate problem solving strategies by looking for the unknown "third possibility" 3. Demonstrate understanding of fallacies 4. Demonstrate expected value in a simplified real life situation	1. Shortening river vs. infinite coastline 2. Arlo Guthrie recording leading to Burns Book of Think pg. 73-86 Brian Push-Ups and Simeon's triangle puzzle 3. Create print advertisements using misleading data and fallacies 4. Hermit Epidemic (http://www.mste.uiuc.edu/hill/ev/hermitp rob.html)
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
10	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Generate criteria for a "good" paper airplane & solve the problem of creating one 2. Describe data collected during UScensus 3. Solve a word problem using a tally 4. Classify the roll of data in an argument by analyzing a conversation void of argumentative content	1. Paper airplane activity 2. Explore US Census questionnaires 3. A Minute Past 4. Argument Clinic
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		

Day	When	Goals <i>Students Will Be Able To:</i>	Activities
11	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Demonstrate probability formula for shared birthday problem 2. Describe financial data from the stock market report 3. Demonstrate an anonymity protecting survey using probability and a coin toss	1. Shared birthday problem 2. Stock market analysis activity 3. Coin flip survey (Burger 585)
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
12	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Demonstrate permutation and combination formulas 2. Demonstrate creating a graph by converting database information into a computer generated graph using MSExcel	1. Perm and Comb activity & Pascal's Triangle 2. Census data graph activity
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
13	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Distinguish competitive vs. cooperative negotiation and adopt criteria for decision making 2. Demonstrate rules of data gathering, displaying, and analyzing 3. Demonstrate odds of winning the lottery by using a proportional comparison to newspaper thickness	1. Win as much as You Can 2. The Mystery of Blacktail Canyon 3. Lottery Announcement Activity
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
14	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Solve a problem of cost per pound by gathering data and using proportion 2. Adopt 3. Classify the counter-intuitive concept of conflicting aggregate data 4. Demonstrate understanding of ten course goals	1. Bubblegum vs. farm equipment activity 2. Data, chance and the scientific method activity 3. Course goals poster 4. Simpson's Paradox 5. Continue Blacktail Canyon
	Early Afternoon 12:30-2:30 (120 minutes)		
	Late Afternoon 2:45-4:15 (90 minutes)		
15	Morning 9:00-11:30 (150 minutes) minus 15 min. Break	1. Demonstration of data manipulation rules continued 2. Demonstrate Understanding of course content by presenting reflection posters	1. Complete Blacktail Canyon 2. Presentation of student summaries