Data & Chance – Course Syllabus

Day	When	Goals *Students Will Be Able To:*	Activities
1	Morning 9:00-11:30 (150 minutes) minus 15 min. Break Early Afternoon 12:30-2:30 (120 minutes) Late Afternoon 2:45-4:15 (90 minutes)	1. Demonstrate the importance establishing and controlling units of measure 2. Distinguish fare random number generators from bias number generators 3. Classify characteristics on 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
Day 2	Morning 9:00-11:30 (150 minutes) minus 15 min. Break Early Afternoon 12:30-2:30 (120 minutes) Late Afternoon 2:45-4:15 (90 minutes)	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	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
Day 3	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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
Day 4	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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 4. Compare Kearns vs. Jordan data 5. Mean, Median, Mode, & Range 6. Make a spinner activity 7. Actuary Article

Day	When	Goals *Students Will Be Able To:*	Activities
Day 5	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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
Day 6	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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)
Day 7	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	1. Continue wall design activity 2. Generate a Likert scale by witing 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 4. Ahnentafel Numbers
Day 8	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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

Day	When	Goals *Students Will Be Able To:*	Activities
Day 9	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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
Day 10	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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
Day 11	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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)
Day 12	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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
Day 13	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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
Day 14	Morning (135 minutes) Early Afternoon (120 minutes) Late Afternoon (90 minutes)	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 goal	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
Day 15	Morning (135 minutes) Early Afternoon (120 minutes)	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