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Computing Technology for Math Excellence

Preparing for the Ohio Graduation Test in Mathematics

Strand Resources: Data Analysis and Probability

The following pages are for students. Use them to help you monitor your own test preparation. You can print the entire booklet, or just those pages for benchmarks you want to work on. The resources provided are at CT4ME: http://www.ct4me.net/Ohio_Graduation_Math_Test_Prep_DataStrand.htm

Directions:

1. Identify the benchmark (A-K) below for review in Data Analysis and Probability. Below the benchmark, you will find Web resources for reviewing the concept and practice problems.

2. *Before beginning the Web exercises* for the benchmark you chose, fill in the "K" column: What do you already know about that benchmark? Then in the "W" column: Write what you still want to know.

3. When you have completed using a resource provided, place a check in the box in the first column. This will help you keep track of resources used. Decide if the resource was helpful. Write "yes" or "no" in the last column. Add your comments, if any, about the resource.

4. *After using all the resources* for each benchmark, go to the "L" column and write what you learned. Read your "K" column entries again to see if any of your prior knowledge was inaccurate, and rewrite those statements so that they are correct.

5. Look at the "W" column again, and place a check next to any of your questions that were not answered by using the resources. Be sure to mention those questions in class. Decide how you will find answers to those remaining questions.

6. *When you have completed all of the exercises provided with each benchmark and your K-W-L chart is complete*, reflect on your overall understanding of the benchmark. Be honest with yourself. In the last column circle your belief about your level of mastery: still no or very little understanding (N), some to a great deal of progress (P), I've got it!-- mastery (M).

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A. Create, interpret and use graphical displays and statistical measures to describe data; e.g., box-and-whisker plots, histograms, scatterplots, measures of center and variability.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	Connexions: The basics about line graphs in representing data. Short module by David Lane of Rice University shows how line graphs compare to bar graphs and when to use line graphs. Two self-check questions included.	
	National Center for Education Statistics (for students): Create a Graph	
	Oswego City School District (NY), Intermediate Test Prep Center, Math 8: • Know how to create, read, and interpret graphs: circle, bar, histogram, line, pictograph, and stem	

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	and leaf • Determine and justify the most appropriate graph to display a given set of data (pictograph, bar graph, line graph, histogram or circle graph)	
	Worsley School, Bill Willis: Box and Whisker Plots	
	Statistics Canada: Statistics, Power from Data: Graph Types and create your graph	
	Glencoe Online Study Tools, Mathematics, Algebra 2005, multiple choice practice: • Box and Whisker Plots • Histograms • Statistics: Scatter Plots and Lines of Fit	

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	NCTM E-examples: Line of Best Fit: Linear Regression and Least Squares	
	Utah State University, National Library of Virtual Manipulatives: • Data Analysis and Probability Manipulatives--select by grade band • Box Plots and Histograms • Scatterplots	
	JAVA applet for Scatterplots from the Math Department at Hobart and William Smith Colleges: Launch the scatter plot, modify data and view the resulting line of best fit.	
	▦ Play video at YouTube.com: WASL 10-1-19: Box-and-Whisker Plots 2: Quick video on how to find the median from a box-and-whisker graph.	

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B. Evaluate different graphical representations of the same data to determine which is the most appropriate representation for an identified purpose.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	Statistical Graphs: Choosing an Appropriate Graph depends on the "type and breadth of the data, the audience it is directed to, and the questions being asked." Eleven graph types are discussed with advantages and disadvantages of each.	
	Oswego City School District (NY), Regents Prep: Collecting and Organizing Data	
	Eduplace.com: Choosing an Appropriate Graph	

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C. Compare the characteristics of the mean, median and mode for a given set of data, and explain which measure of center best represents the data.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	Statistics Canada: Statistics, Power from Data: Measures of Central Tendency	
	University of Illinois at Urbana-Champaign, Jay Hill: Introduction to Descriptive Statistics--mean, median, mode, range, and so on, simply explained.	
	BBC: Data Handling, the Mean, Median, and Mode	

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	▦ Play video at YouTube.com: Mean, Median, and Mode: definitions and example of how to calculate each. This was posted from Nutshellmath.com	

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D. Find, use and interpret measures of center and spread, such as mean and quartiles, and use those measures to compare and draw conclusions about sets of data.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	Shodor Interactive: Introduction to Statistics: Mean, Median, Mode	
	AlgebraLab.org: Mean, Median, Mode. Lesson, interactive online practice problems. Show the Related AlgebraLab documents for activities, additional practice problems and word problems.	
	Oswego City School District (NY), Regents Prep, new Algebra section: • Mean, Median, Mode	

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	• **Quartiles and Percentiles**	
	Glencoe Online Study Tools, Mathematics, Algebra 2005, multiple choice practice: Measures of Variation	
	▦ Play video at YouTube.com: GCSE Maths Median and IQR: This short video shows how to find a median, lower quartile, upper quartile, then inter-quartile range.	

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E. Evaluate the validity of claims and predictions that are based on data by examining the appropriateness of the data collection and analysis.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	Glencoe Online Study Tools, IMPACT Mathematics, Course 1, multiple choice practice: Collecting and Analyzing Data	
	North Canton City Schools (OH): Misleading Graphs	
	BBC: Data Handling, Interpreting Data	

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F. Construct convincing arguments based on analysis of data and interpretation of graphs.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	Interpret line graphs from the Earth Observatory at NASA. Analyze some temperature and precipitation graphs from different cities and match them up to the correct biome.	
	South Dakota Department of Education: Graphs and Charts, Online Activities	
	Glencoe Online Study Tools, Mathematics: Applications and Connections, Course 3, multiple choice practice: Misleading Graphs and Statistics	

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	Glencoe Online Study Tools, IMPACT Mathematics, Course 3, multiple choice practice: • Data Patterns in Tables and Graphs • Models, Data, and Decisions	
	Edmonton Public Schools (CA), Jim Reed, Math 8: Problem Solving with Data, Reading and Interpreting Graphs	

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G. Describe sampling methods and analyze the effects of method chosen on how well the resulting sample represents the population.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned

Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	Statistics Canada: Statistics, Power from Data: Sampling Methods	
	Edmonton Public Schools (CA), Jim Reed, Math 9: Interactive Sampling Terminology	
	Glencoe Online Study Tools, Mathematics, Algebra 2005, multiple choice practice: Sampling and Bias	

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H. Use counting techniques, such as permutations and combinations, to determine the total number of options and possible outcomes.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	Glencoe Online Study Tools, Mathematics: Applications and Connections, Course 3, multiple choice practice: • Permutations • Combinations	
	Glencoe Online Study Tools, Mathematics, Algebra 2005, multiple choice practice: • Counting Outcomes • Permutations and Combinations	

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	Oswego City School District (NY), Regents Prep: • Counting Principle • Permutations • Combinations	
	Webmath.com: Permutations verify your list of permutations for up to 8 entries.	
	▓ Play video at YouTube.com: Probability and Statistics: Review the counting principle and permutations. This was posted from Nutshellmath.com	

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I. Design an experiment to test a theoretical probability, and record and explain results.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	AlgebraLab.org: Law of Large Numbers and Simulations explains the process of experimental probability and suggests experiments to try. Be sure to show related AlgebraLab documents for additional lessons and practice problems in probability.	
	Glencoe Online Study Tools, Mathematics: Applications and Connections, Course 3, multiple choice practice: Using Sampling to Predict	

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J. Compute probabilities of compound events, independent events, and simple dependent events.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	What are the Odds? The Ins and Outs of Probability (by graduate students at University of Virginia): Take a nine-question interactive quiz assessing common probability misconceptions relating to compound and simple events, sample size, representativeness, and so on.	
	Glencoe Online Study Tools, Mathematics: Applications and Connections, multiple choice practice: • Course 2, Independent and Dependent Events	

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	• Course 3, Probability of Compound Events	
	Edmonton Public Schools (CA), Jim Reed, Math 8: Independent Events	
	Integrated Publishing: Dependent Events, explanation of probability and problems	
	▦ Play videos at YouTube.com: • GCSE Probability Part 1: This video is from a professor in Great Britain who nicely explains probability and shows examples: expected frequency, the typical problems involving picking balls from a bag, mutually exclusive events, independent events, and drawing diagrams to help identify possibilities. • Probability Part 2: tree diagrams. The same professor in Great Britain discusses the balls in a bag problems when making two picks, which leads to tree diagrams to help determine probability involving replacing after each pick, and then not replacing after a pick.	

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K. Make predictions based on theoretical probabilities and experimental results.		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the Web resource helpful? (yes/no) Comment(s)
	Glencoe Online Study Tools, Mathematics: Applications and Connections, multiple choice practice: • Course 2, Theoretical and Experimental Probability • Course 3, Experimental Probability	
	Edmonton Public Schools (CA), Jim Reed, Math 9: Using Probability	
	Utah State University, National Library of Virtual Manipulatives: Box Model -- investigate theoretical and experimental probabilities.	

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Are you ready for the test?

1. Don't forget to review and complete the Six Steps for Success, including the full online practice tests.

2. Complete: Statistics, Data Analysis, and Probability Strand Questions using California's High School Exit Examination (CAHSEE) released questions.

   How did you do?

   Score: _____ right out of _____ questions.

Look at the "W" column again for the benchmarks you chose to work on. List the questions you checked that you still have. For each of those, decide how you will find the answer.	
What I still **W**ANT to know—my unanswered questions	My Plan to Find the Answers

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Use this page for additional resources you use for test preparation. Write the benchmark.

Benchmark:		Circle Mastery Level: N P M
What I **K**now	What I **W**ANT to know	What I **L**earned
Check when completed	Resources	Was the resource helpful? (yes/no) Comment(s)