

# Data and Probability

Michigan's Mathematics Grade Level Content Expectations in Data and Probability are categorized into three domains:

- Data representation (RE)
- Data interpretation and analysis (AN)
- Probability (PR)

The expectations in this strand focus heavily on working with given data sets and representing them graphically in the early grades. In the middle school years more sophisticated data representations are created and statistics that describe data sets are introduced. Students are asked to solve problems using information from data sets. Basic ideas from probability are introduced in depth in the middle grades, in connection with ideas in the Number and Operations strand in the area of ratio. By the end of grade eight, students are expected to have a working understanding of fundamental ideas about data and probability, as an element of general quantitative literacy. Additionally, the Data and Probability strand provides the opportunity to reinforce number operations and representation.

NUMBER & OPERATIONS

ALGEBRA

MEASUREMENT

GEOMETRY

DATA & PROBABILITY

**Contact:**

**Michigan Department of Education**  
 Office of School Improvement  
 Dr. Yvonne Caamal Canul, Director  
 (517) 241-3147  
[www.michigan.gov/mde](http://www.michigan.gov/mde)



*Professional organization whose members have contributed to the development of Michigan's K-8 Grade Level Content Expectations through their work on committees:*



Michigan Council of Teachers of Mathematics



[www.michigan.gov/mde](http://www.michigan.gov/mde)



		Data Representation								
		K	I	2	3	4	5	6	7	8
Data Representation			<b>D.RE.01.01</b> Collect and organize data to use in pictographs.			<b>D.RE.04.02</b> Order a given set of data, find the median, and specify the range of values.				
			<b>D.RE.01.03</b> Make pictographs of given data using both horizontal and vertical forms of graphs; scale should be in units of one and include symbolic representations, e.g., ☺ represents one child.	<b>D.RE.02.01</b> Make pictographs using a scale representation, using scales where symbols equal more than one.		<b>D.RE.04.01</b> Construct tables and bar graphs from given data.	<b>D.RE.05.02</b> Construct line graphs from tables of data; include axis labels and scale.		<b>D.RE.07.01</b> Represent and interpret data using circle graphs, stem and leaf plots, histograms, and box-and-whisker plots, and select appropriate representation to address specific questions.	
		<b>D.RE.01.02</b> Read and interpret pictographs.	<b>D.RE.02.02</b> Read and interpret pictographs with scales, using scale factors of 2 and 3.	<b>D.RE.03.01</b> Read and interpret bar graphs in both horizontal and vertical forms. <b>D.RE.03.02</b> Read scales on the axes and identify the maximum, minimum, and range of values in a bar graph.	<b>D.RE.05.01</b> Read and interpret line graphs, and solve problems based on line graphs, e.g., distance – time graphs, and problems with two or three line graphs on same axes, comparing different data.					
			<b>D.RE.02.03</b> Solve problems using information in pictographs; include scales such as each ■ represents 2 apples; avoid □ cases.	<b>D.RE.03.03</b> Solve problems using information in bar graphs, including comparison of bar graphs.	<b>D.RE.04.03</b> Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.					
		Analyzing Data								
Analyzing Data							<b>D.AN.05.03</b> Given a set of data, find and interpret the mean (using the concept of fair share) and mode. <b>D.AN.05.04</b> Solve multi-step problems involving means.		<b>D.AN.07.04</b> Find and interpret the median, quartiles, and interquartile range of a given set of data.	<b>D.AN.08.01</b> Determine which measure of central tendency (mean, median, mode) best represents a data set, e.g., salaries, home prices, for answering certain questions; justify the choice made.
								<b>D.AN.07.02</b> Create and interpret scatter plots and find line of best fit; and use an estimated line of best fit to answer questions about the data.	<b>D.AN.08.02</b> Recognize practices of collecting and displaying data that may bias the presentation or analysis.	
									<b>D.AN.07.03</b> Calculate and interpret relative frequencies and cumulative frequencies for given data sets.	
		Probability								
Probability							<b>D.PR.06.01</b> Express probabilities as fractions, decimals, or percentages between 0 and 1; know that 0 probability means an event will not occur and that probability 1 means an event will occur. <b>D.PR.06.02</b> Compute probabilities of events from simple experiments with equally likely outcomes, e.g., tossing dice, flipping coins, spinning spinners, by listing all possibilities and finding the fraction that meets given conditions.			<b>D.PR.08.03</b> Compute relative frequencies from a table of experimental results for a repeated event. Interpret the results using relationship of probability to relative frequency.
									<b>D.PR.08.04</b> Apply the Basic Counting Principle to find total number of outcomes possible for independent and dependent events, and calculate the probabilities using organized lists or tree diagrams.	<b>D.PR.08.05</b> Find and/or compare the theoretical probability, the experimental probability, and/or the relative frequency of a given event.
									<b>D.PR.08.06</b> Understand the difference between independent and dependent events, and recognize common misconceptions involving probability, e.g., Alice rolls a 6 on a die three times in a row; she is just as likely to roll a 6 on the fourth roll as she was on any previous roll.	

\* revised expectations in italics