

# D. DATA

By the end of each grade, students will:

Ontario Mathematics Curriculum Expectations, Grades 1 to 8, 2020

OVERALL EXPECTATION D1. manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life							
SPECIFIC EXPECTATIONS							
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
<b>Data Collection and Organization</b>							
<b>D1.1</b> sort sets of data about people or things according to one attribute, and describe rules used for sorting	<b>D1.1</b> sort sets of data about people or things according to two attributes, using tables and logic diagrams, including Venn and Carroll diagrams	<b>D1.1</b> sort sets of data about people or things according to two and three attributes, using tables and logic diagrams, including Venn, Carroll, and tree diagrams, as appropriate	<b>D1.1</b> describe the difference between qualitative and quantitative data, and describe situations where each would be used	<b>D1.1</b> explain the importance of various sampling techniques for collecting a sample of data that is representative of a population	<b>D1.1</b> describe the difference between discrete and continuous data, and provide examples of each	<b>D1.1</b> explain why percentages are used to represent the distribution of a variable for a population or sample in large sets of data, and provide examples	<b>D1.1</b> identify situations involving one-variable data and situations involving two-variable data, and explain when each type of data is needed
<b>D1.2</b> collect data through observations, experiments, and interviews to answer questions of interest that focus on a single piece of information; record the data using methods of their choice; and organize the data in tally tables	<b>D1.2</b> collect data through observations, experiments, and interviews to answer questions of interest that focus on two pieces of information, and organize the data in two-way tally tables	<b>D1.2</b> collect data through observations, experiments, and interviews to answer questions of interest that focus on qualitative and quantitative data, and organize the data using frequency tables	<b>D1.2</b> collect data from different primary and secondary sources to answer questions of interest that involve comparing two or more sets of data, and organize the data in frequency tables and stem-and-leaf plots	<b>D1.2</b> collect data, using appropriate sampling techniques as needed, to answer questions of interest about a population, and organize the data in relative-frequency tables	<b>D1.2</b> collect qualitative data and discrete and continuous quantitative data to answer questions of interest about a population, and organize the sets of data as appropriate, including using intervals	<b>D1.2</b> collect qualitative data and discrete and continuous quantitative data to answer questions of interest, and organize the sets of data as appropriate, including using percentages	<b>D1.2</b> collect continuous data to answer questions of interest involving two variables, and organize the data sets as appropriate in a table of values

**OVERALL EXPECTATION D1.** manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

**SPECIFIC EXPECTATIONS**

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
<b>Data Visualization</b>							
<p><b>D1.3</b> display sets of data, using one-to-one correspondence, in concrete graphs and pictographs with proper sources, titles, and labels</p>	<p><b>D1.3</b> display sets of data, using one-to-one correspondence, in concrete graphs, pictographs, line plots, and bar graphs with proper sources, titles, and labels</p>	<p><b>D1.3</b> display sets of data, using many-to-one correspondence, in pictographs and bar graphs with proper sources, titles, and labels, and appropriate scales</p>	<p><b>D1.3</b> select from among a variety of graphs, including multiple-bar graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs</p>	<p><b>D1.3</b> select from among a variety of graphs, including stacked-bar graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs</p>	<p><b>D1.3</b> select from among a variety of graphs, including histograms and broken-line graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs</p>	<p><b>D1.3</b> select from among a variety of graphs, including circle graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs</p>	<p><b>D1.3</b> select from among a variety of graphs, including scatter plots, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs</p>
			<p><b>D1.4</b> create an infographic about a data set, representing the data in appropriate ways, including in frequency tables, stem-and-leaf plots, and multiple-bar graphs, and incorporating any other relevant information that helps to tell a story about the data</p>	<p><b>D1.4</b> create an infographic about a data set, representing the data in appropriate ways, including in relative-frequency tables and stacked-bar graphs, and incorporating any other relevant information that helps to tell a story about the data</p>	<p><b>D1.4</b> create an infographic about a data set, representing the data in appropriate ways, including in tables, histograms, and broken-line graphs, and incorporating any other relevant information that helps to tell a story about the data</p>	<p><b>D1.4</b> create an infographic about a data set, representing the data in appropriate ways, including in tables and circle graphs, and incorporating any other relevant information that helps to tell a story about the data</p>	<p><b>D1.4</b> create an infographic about a data set, representing the data in appropriate ways, including in tables and scatter plots, and incorporating any other relevant information that helps to tell a story about the data</p>

**OVERALL EXPECTATION D1.** manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

**SPECIFIC EXPECTATIONS**

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
<b>Data Analysis</b>							
<b>D1.4</b> order categories of data from greatest to least frequency for various data sets displayed in tally tables, concrete graphs, and pictographs	<b>D1.4</b> identify the mode(s), if any, for various data sets presented in concrete graphs, pictographs, line plots, bar graphs, and tables, and explain what this measure indicates about the data	<b>D1.4</b> determine the mean and identify the mode(s), if any, for various data sets involving whole numbers, and explain what each of these measures indicates about the data	<b>D1.5</b> determine the mean and the median and identify the mode(s), if any, for various data sets involving whole numbers, and explain what each of these measures indicates about the data	<b>D1.5</b> determine the mean and the median and identify the mode(s), if any, for various data sets involving whole numbers and decimal numbers, and explain what each of these measures indicates about the data	<b>D1.5</b> determine the range as a measure of spread and the measures of central tendency for various data sets, and use this information to compare two or more data sets	<b>D1.5</b> determine the impact of adding or removing data from a data set on a measure of central tendency, and describe how these changes alter the shape and distribution of the data	<b>D1.5</b> use mathematical language, including the terms “strong”, “weak”, “none”, “positive”, and “negative”, to describe the relationship between two variables for various data sets with and without outliers
<b>D1.5</b> analyse different sets of data presented in various ways, including in tally tables, concrete graphs, and pictographs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions	<b>D1.5</b> analyse different sets of data presented in various ways, including in logic diagrams, line plots, and bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions	<b>D1.5</b> analyse different data sets presented in various ways, including in frequency tables and in graphs with different scales, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions	<b>D1.6</b> analyse different sets of data presented in various ways, including in stem-and-leaf plots and multiple-bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions	<b>D1.6</b> analyse different sets of data presented in various ways, including in stacked-bar graphs and in misleading graphs, by asking and answering questions about the data, challenging preconceived notions, and drawing conclusions, then make convincing arguments and informed decisions	<b>D1.6</b> analyse different sets of data presented in various ways, including in histograms and broken-line graphs and in misleading graphs, by asking and answering questions about the data, challenging preconceived notions, and drawing conclusions, then make convincing arguments and informed decisions	<b>D1.6</b> analyse different sets of data presented in various ways, including in circle graphs and in misleading graphs, by asking and answering questions about the data, challenging preconceived notions, and drawing conclusions, then make convincing arguments and informed decisions	<b>D1.6</b> analyse different sets of data presented in various ways, including in scatter plots and in misleading graphs, by asking and answering questions about the data, challenging preconceived notions, and drawing conclusions, then make convincing arguments and informed decisions

**OVERALL EXPECTATION D2.** describe the likelihood that events will happen, and use that information to make predictions

**SPECIFIC EXPECTATIONS**

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
<b>Probability</b>							
<p><b>D2.1</b> use mathematical language, including the terms “impossible”, “possible”, and “certain”, to describe the likelihood of events happening, and use that likelihood to make predictions and informed decisions</p>	<p><b>D2.1</b> use mathematical language, including the terms “impossible”, “possible”, and “certain”, to describe the likelihood of complementary events happening, and use that likelihood to make predictions and informed decisions</p>	<p><b>D2.1</b> use mathematical language, including the terms “impossible”, “unlikely”, “equally likely”, “likely”, and “certain”, to describe the likelihood of events happening, and use that likelihood to make predictions and informed decisions</p>	<p><b>D2.1</b> use mathematical language, including the terms “impossible”, “unlikely”, “equally likely”, “likely”, and “certain”, to describe the likelihood of events happening, represent this likelihood on a probability line, and use it to make predictions and informed decisions</p>	<p><b>D2.1</b> use fractions to express the probability of events happening, represent this probability on a probability line, and use it to make predictions and informed decisions</p>	<p><b>D2.1</b> use fractions, decimals, and percents to express the probability of events happening, represent this probability on a probability line, and use it to make predictions and informed decisions</p>	<p><b>D2.1</b> describe the difference between independent and dependent events, and explain how their probabilities differ, providing examples</p>	<p><b>D2.1</b> solve various problems that involve probability, using appropriate tools and strategies, including Venn and tree diagrams</p>
<p><b>D2.2</b> make and test predictions about the likelihood that the categories in a data set from one population will have the same frequencies in data collected from a different population of the same size</p>	<p><b>D2.2</b> make and test predictions about the likelihood that the mode(s) of a data set from one population will be the same for data collected from a different population</p>	<p><b>D2.2</b> make and test predictions about the likelihood that the mean and the mode(s) of a data set will be the same for data collected from different populations</p>	<p><b>D2.2</b> make and test predictions about the likelihood that the mean, median, and mode(s) of a data set will be the same for data collected from different populations</p>	<p><b>D2.2</b> determine and compare the theoretical and experimental probabilities of an event happening</p>	<p><b>D2.2</b> determine and compare the theoretical and experimental probabilities of two independent events happening</p>	<p><b>D2.2</b> determine and compare the theoretical and experimental probabilities of two independent events happening and of two dependent events happening</p>	<p><b>D2.2</b> determine and compare the theoretical and experimental probabilities of multiple independent events happening and of multiple dependent events happening</p>