

Data Analysis: Inference and Modelling Grade Band: K-2

Grade	Standard DA.IM.01
K	With guidance, draw conclusions and make predictions based on picture graphs or patterns (e.g., make predictions based on weather data presented in a picture graph, complete a pattern) with or without a computing device .
1	With guidance, identify, interpret, and analyze data from a chart or graphical display (visualization) in order to make a prediction, with or without a computing device
2	With guidance, collect, organize, present, and analyze data from a chart or graphical display (visualization) in order to make a prediction, with or without a computing device.

Grade	Essential Skills
K	Identify patterns and trends in picture graphs Make predictions, comparisons, and/or draw conclusions from information in picture graphs or patterns.
1	Identify what kind of data is contained in a data display. Make a prediction, a comparison or draw a conclusion from a data display
2	Collect, record, and organize data. Present a data display and draw a conclusion or make a prediction.

Explanation
Students will be able to determine what data is being displayed in a given visualization and use displays of data to draw conclusions, make predictions and identify patterns. For example, students will record the temperature each day to determine that through the spring months the overall temperature increases (even if sometimes a day is cooler than the day before). Using data instead of casual observations provides objective information to draw conclusions, discern patterns, and make predictions.

Think of this as similar to....
When you look at a photograph you can gather information such as place, time of day, etc.

Essential Questions
What information can you learn from a data display?
What conclusions and/or predictions can you make from a data display?
Why would you use data when looking for patterns, making predictions, or drawing conclusions?

Implementation Examples—What would this look like in the classroom?

Grade(s)	Title	Description	Link	Content Connection & Notes
K	Pushes and Pulls	Grade K - Students gather data about how different designs (for example the height or length of ramp) change the distance a ball will roll. With guidance, they add the data to a picture graph and compare the designs to each other in terms of which design makes the ball go farther. Students should note patterns in the data (the higher the ramp the farther the ball goes) make predictions about how changing the design will affect the distance the ball rolls. If practical, they can test their predictions.		This lesson also aligns with NGSS K-PS2-2 and MATH K.MD.A.2
K-1	Survey and Data	Grade K- Using data collected and displayed from a class survey (for example, about favorite ice cream flavor) students draw conclusions about which flavor is most popular. Grade 1- Students can extend their survey to their families and/or other classes. They can note patterns in ice cream preferences of adults vs. children, etc. and make predictions based on those patterns. They can use a spreadsheet, instead of the post-it graph, and generate a chart from their data.	Survey and Data	This lesson also aligns with CS DA.CVT.01 and MATH K.CC.B.4a and K.CC.B.5
K-2	Weather Predictions	Grade K- Using picture graphs of the weather (sunny, cloudy, rain, snow) recorded each day, students identify the trends and patterns from data itself (it rained on Friday 3 weeks in a row) and from data displayed cumulatively (it rained more in April than in May). Grade 1- Students collect temperature data as well as weather data and use it to predict what the temperatures will be the following week. They should distinguish between the numerical data of temperature and the categorical data of the weather (sunny, cloudy, etc.) Grade 2- Students collect and record temperature data at the beginning and end of the school day. They choose method(s) to organize and display their data. Once there is sufficient data, they can analyze displays of the temperatures, identify the patterns of when temperatures rise and fall, and predict if they think the temperature will rise or fall at a particular time of the day, based on the pattern observed. They can also look for patterns that relate temperature to weather (is it usually warmer when it is cloudy or sunny? does the season or time of day affect the pattern?)		This lesson also aligns with CS DA.CVT.01 , NGSS K-ESS2-1 and MATH K.CC.B.4a and K.CC.B.5

Grade(s)	Title	Description	Link	Content Connection & Notes
1	Beam of Light	Grade 1- Students should use the displays created from the data they collected when they put different objects in a beam of light to make a prediction about what effect a material they did not use in their experiment would have on the beam of light. If reasonable they should test their prediction. Students should also distinguish between the categorical data (clear, cloudy, etc.) and the numerical data displays.		This lesson also aligns with CS 1.DA.CVT.01 and NGSS 1-PS4-3
2	Cookie Stacking	Grade 2- Students estimate how many objects (cookies, checkers, etc.) they can stack and then perform two trials to stack objects as high as they can. They record their results using tally marks and then graph their results. Students should compare the results of their first and second trials to their original estimate and to each other. They should use their data to make a prediction about how many objects they could stack in future trials. Using the data from the whole class will allow for additional analysis (and discussion of the advantages of more data).	Cookie Stacking	This lesson also aligns with CS 2.DA.CVT.01 and MATH 2.MD.10
2	Picturing Data	Grade 2- Students run a supplied program in Code.org's Play Lab. The program generates a random number of animals each time it is run. Students tally the number of animals on a printed worksheet. Students count the animals and display their data using tally marks, they then use the data to create a bar graph and a pie chart. Students are asked to compare the numbers of different animals and determine which appeared the least and the most.	Picturing Data	This lesson also aligns with CS 2.DA.CVT.01 and MATH 2.MD.10. The puzzle can be linked directly.

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These annotations are a collaboration between [Maryland Center for Computing Education](#) and the [Maryland State Department of Education](#).