# Statistics and probability

International Baccalaureate · IB Diploma · Mathematics: Applications and Interpretation · SL · Vocabulary in context

| Word | Example |
|---|---|
| **population** /ˌpɒpjʊ'leɪʃn/ | Define the **population** before deciding whom to include. |
| **sample** /'sæmpl/ | The **sample** contains the people selected for this study. |
| **discrete data** | **Discrete data** can take only certain values, such as the number of children in a family. |
| **continuous data** | **Continuous data** can take any value in a range, such as height or time. |
| **outlier** /'aʊtlaɪə/ | Leave out the **outlier** when you draw the line. |
| **mean** /mi:n/ | The **mean** is the total divided by the number of values. |
| **median** /'mi:di:ən/ | Put the values in order before you find the **median**. |
| **mode** /məʊd/ | The **mode** is the most common value. |
| **quartile** /'kwɔ:taɪl/ | The lower **quartile** is a quarter of the way through the data. |
| **interquartile range** /ˌɪntə'kwɔ:taɪl reɪndʒ/ | Subtract the lower quartile from the upper for the **interquartile range**. |
| **standard deviation** /'stændəd ˌdi:vɪ'eɪʃn/ | A larger **standard deviation** means the values are more spread out. |



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| **cumulative frequency** /'kju:mjʊlətɪv 'fri:kwənsi/ | **Cumulative frequency** adds each count to all earlier counts. |
| **box plot** /bɒks plɒt/ | A **box plot** displays the median and quartiles. |
| **scatter diagram** /'skætə 'daɪəgræm/ | A **scatter diagram** shows two variables as points. |
| **regression line** /rɪ'greʃn laɪn/ | A **regression line** $y = a + bx$ is the line of best fit for predicting y from x. $y = a + bx$ x y |
| **interpolation** /ɪnˌtɜ:pə'leɪʃn/ | **Interpolation** estimates a value inside the range of the data. |
| **extrapolation** /ek'stræpəleɪʃn/ | Predicting beyond the data is **extrapolation**. |
| **Spearman's rank correlation coefficient** /'spɪəmənz ræŋk ˌkɒrɪ'leɪʃn ˌkəʊɪ'fɪʃənt/ | **Spearman's rank correlation coefficient** compares two rankings. |
| **probability** /ˌprɒbə'bɪlɪti/ | A fair coin gives **probability** one half for heads. |
| **sample space** /'sæmpl speɪs/ | The **sample space** is the list of all possible outcomes. |
| **mutually exclusive** /'mju:tʃu:əli eks'klu:sɪv/ | **Mutually exclusive** outcomes cannot occur together. |
| **independent** /ˌɪndɪ'pendənt/ | **Independent** events do not change each other's probabilities. |
| **tree diagram** /tri: 'daɪəgræm/ | A **tree diagram** shows each stage of a probability problem. |

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| **discrete random variable** /dɪˈskriːt ˈrændəm ˈveərɪəbl/ | A **discrete random variable** X takes separate values, each with a probability.  |
| **expected value** /ekˈspektɪd ˈvælju:/ | The **expected value** of one dice roll is 3.5.  |
| **normal distribution** /ˈnɔːml ˌdɪstrɪˈbjuːʃn/ | A **normal distribution** has a symmetric bell-shaped density curve. |
| **null hypothesis** /nʌl haɪˈpɒθəsɪs/ | The **null hypothesis** specifies the parameter value being tested. |
| **alternative hypothesis** /ɔːlˈtɜːnətɪv haɪˈpɒθəsɪs/ | The **alternative hypothesis** says the coin favours heads. |
| **significance level** /sɪgˈnɪfɪkəns ˈlevl/ | Set the **significance level** before looking at the observed result. |
| **chi-squared test** /kaɪ skweəd test/ | A **chi-squared test** checks whether our counts are close to the expected counts. |
| **contingency table** /kənˈtɪndʒənsi ˈteɪbl/ | A **contingency table** shows counts for two variables. |
| **degrees of freedom** /dɪˈgriːz ɒv ˈfriːdəm/ | A mechanism with one **degree of freedom** needs one motor. |
| **critical value** /ˈkrɪtɪkl ˈvælju:/ | The **critical value** is the edge of the critical region. |
| **goodness of fit test** | A **goodness of fit test** checks whether data follow a given distribution. |
| **one-tailed** /wʌn teɪld/ | A **one-tailed** test checks only whether the mean has gone up. |



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| Word | Example |
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| **two-tailed** /tu: teɪld/ | A **two-tailed** test looks for a difference in either direction. |