**API CAN CODE**

**UNIVERSITY OF MARYLAND**

# Comparison of Data Science Tools For K-12

- **Tools' Capabilities**
- **Supported Interactions and Educational Features**
- **Supported Accessibility Features**

**Table 1: Tools' Capabilities**

| Tools | Data Manipulations | Statistical Capabilities | Data Visualization | | | Data Availability | | | | Extensibility |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Tabular Display | Type of Graph | Creation Method | Built-in Data | Import | API | Export | |
| Blockly | Aggregating | N/A | ✗ | Line | Code | ✗ | ✓ | ✗ | ✓ | ✓ |
| BlocklyDS | Filtering, Aggregating | Correlation, Linear Regression, Decision Trees | ✓ | Scatterplot, Bar Chart, Line Chart, Pie Chart, Box Plot, Histogram | Blocks | ✗ | ✓ | ✗ | ✓ | ✗ |
| BlocklySQL | Filtering, Sorting, Aggregating | N/A | ✓ | N/A | N/A | ✓ | ✗ | ✗ | ✓ | ✓ |
| BlockPy | Filtering, Sorting | N/A | ✗ | Scatterplot, Bar Chart, Line Chart, Box Plot, Histogram | Blocks / Code | ✓ | ✓ | ✗ | ✓ | ✗ |
| Bridges CS | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression | ✗ | Line Chart | Code | ✓ | ✓ | ✗ | ✓ | ✗ |
| CODAP | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression | ✓ | Scatterplot, Bar Chart, Histogram, Box Plot, Map | GUI | ✓ | ✓ | ✓ | ✓ | ✓ |

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| DataClassroom | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression | ✓ | Scatterplot, Bar Chart, Line Chart, Pie Chart, Histogram, Box Plot | GUI | ✓ | ✓ | ✗ | ✓ | ✗ |
| Datacommons | N/A | N/A | ✓ | Scatterplot, Map | GUI | ✓ | ✗ | ✓ | ✓ | ✓ |
| Dataland | Filtering, Sorting, Aggregating | N/A | ✓ | Scatterplot | Blocks | ✗ | ✓ | ✗ | ✓ | ✗ |
| DBSnap | Filtering, Deleting, Sorting, Aggregating | N/A | ✓ | Scatterplot, Bar, Line Chart, Pie Chart, Area, Histogram, Bubble Chart | Blocks | ✓ | ✓ | ✗ | ✗ | ✗ |
| EduBlocks | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression | ✗ | Scatterplot, Bar, Stack Chart, Bar Chart, Line Chart, Stack Graph, Pie Chart, Radar | Blocks / Code | ✗ | ✓ | ✗ | ✗ | ✓ |
| GapMinder | N/A | N/A | ✗ | Scatterplot | GUI | ✓ | ✗ | ✗ | ✓ | ✗ |
| Google Colab | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression | ✓ | Line Chart, Bar Chart, Histogram, Scatterplot, Stack Chart, Pie | Code | ✗ | ✓ | ✓ | ✓ | ✗ |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | Tabular Display | Type of Graph | Creation Method | Built-in Data | Import | API | Export | |
| GP | Filtering, Deleting, Sorting | N/A | ✗ | Chart, 3D Graphs Scatterplot | Blocks | ✗ | ✓ | ✗ | ✓ | ✗ |
| iNZight | Filtering, Sorting | Correlation, Linear Regression | ✓ | Bar, Dotplot, Box Plot, Grid Density, Hexbin Plot | GUI | ✓ | ✓ | ✓ | ✓ | ✗ |
| iSnap | Filtering, Deleting | N/A | ✗ | Scatterplot, Line Chart | Blocks | ✗ | ✓ | ✗ | ✓ | ✗ |
| JASP | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression, Structural Equation Modeling (SEM), Machine Learning | ✓ | Scatterplot, Bar, Line Chart, Histogram, Box Plot, Pie Chart | GUI | ✓ | ✓ | ✗ | ✓ | ✗ |
| Jupyter Notebook | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression | ✓ | Line, Scatterplot, Bar, Histogram, Box Plot, Violin, Pie Chart, etc. | Code | ✗ | ✓ | ✓ | ✓ | ✓ |
| Kaggle | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression | ✓ | Scatterplot, Bar, Line Chart, Histogram, Box Plot, Area Plot, Pie Chart | Code | ✓ | ✓ | ✗ | ✓ | ✗ |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | Tabular Display | Type of Graph | Creation Method | Built-in Data | Import | API | Export | |
| MakeCode Data Science Editor | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression | ✓ | Scatterplot, Bar, Line Chart, Histogram, Box Plot, Heatmap | Blocks | ✓ | ✓ | ✗ | ✓ | ✓ |
| mBlock | Filtering | N/A | ✓ | Scatterplot, Bar, Line Chart, Pie Chart | Blocks / Code | ✓ | ✓ | ✗ | ✓ | ✗ |
| NetsBlox | N/A | N/A | ✗ | Scatterplot, Line Chart, Histogram, Map, Bar Chart | Blocks | ✗ | ✓ | ✓ | ✗ | ✗ |
| PlayData | Filtering, Deleting, Sorting, Aggregating | N/A | ✓ | Scatterplot | Blocks | ✗ | ✓ | ✓ | ✗ | ✗ |
| Pyret | filter, sort | Correlation, Linear Regression | ✓ | Scatterplot, Bar, Line Chart, Pie Chart, Histogram | Code | ✗ | ✓ | ✗ | ✓ | ✗ |
| Quorum | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression | ✗ | Scatterplot, Bar, Pie Chart, Line Chart, Histogram, Box Plot, Violin Plots | Code | ✗ | ✓ | ✗ | ✓ | ✓ |
| Scratch Data Blocks | N/A | N/A | ✓ | Scatterplot, Line Chart | Blocks | ✗ | ✓ | ✗ | ✓ | ✓ |
| Snap! | Filtering, Deleting | N/A | ✓ | Scatterplot, Line Chart | Blocks | ✗ | ✓ | ✗ | ✓ | ✓ |

| Tools | Data Manipulations | Statistical Capabilities | Data Visualization | | | Data Availability | | | | Extensibility |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Tabular Display | Type of Graph | Creation Method | Built-in Data | Import | API | Export | |
| Tableau | Filtering, Deleting, Sorting, Aggregating | Correlation, Linear Regression, Complex Models | ✓ | Scatterplot, Bar Chart, Line Chart, Pie Chart Histogram, Box Plot | GUI | ✓ | ✓ | ✕ | ✓ | ✓ |
| TinkerPlots | filter, sort, aggregate, delete | Correlation, Linear Regression | ✓ | Scatterplot, Pie Chart, Histogram | GUI | ✓ | ✓ | ✕ | ✓ | ✕ |
| Tuva | Filtering, Deleting | Correlation, Linear Regression | ✓ | Scatterplot, Bar, Line Chart, Pie Chart, Histogram, Box Plot, Map | GUI | ✓ | ✓ | ✕ | ✓ | ✕ |

**Table 2: Supported Interactions and Educational Features**

| Tools | Runtime Environment | Programming Modality | Scripting Language | Instructional Materials | Classroom Assignments |
|---|---|---|---|---|---|
| Blockly | Browser | Read-Only One-Way Transition | Python, Javascript, PHP, Lua, DART | ✕ | ✕ |
| Blockly-DS | Browser | Block-based | N/A | ✕ | ✕ |
| BlocklySQL | Browser | Dual Modality | SQL | ✕ | ✕ |
| BlockPy | Browser | Dual Modality | Python | ✓ | ✓ |
| Bridges CS | Win/Mac | Text-Based | C++, Java, Python | ✓ | ✕ |
| CODAP | Browser | GUI | N/A | ✓ | ✓ |
| DataClassroom | Browser | GUI / Text-Based | R | ✓ | ✓ |
| Datacommons | Browser | GUI | N/A | ✓ | ✕ |
| Dataland | Browser | Block-based | N/A | ✕ | ✕ |
| DBSnap | Browser | Read-Only One-Way Transition | SQL | ✕ | ✕ |
| EduBlocks | Browser | Editable One-Way Transition | Python | ✓ | ✓ |
| GapMinder | Browser/Win/Mac | GUI | N/A | ✓ | ✕ |
| Google Colab | Browser | Text-Based | Python, R | ✕ | ✕ |
| GP | Browser/Win/Mac | Block-based | N/A | ✓ | ✕ |
| iNZight | Browser/Win/Mac/Linux | GUI | N/A | ✓ | ✕ |
| iSnap | Browser | Block-based | N/A | ✕ | ✕ |
| Jupyter Notebook | Browser/Win/Mac/Linux | Text-Based | Python | ✕ | ✕ |
| Kaggle | Browser | Text-Based | R, Python | ✓ | ✓ |
| MakeCode Data Science Editor | Browser | Block-based | N/A | ✕ | ✕ |
| mBlock | Browser/Win/Mac/iOS/Android | Read-Only One-Way Transition | Python | ✓ | ✓ |
| NetsBlox | Browser | Block-based | N/A | ✓ | ✕ |
| Playdata | Browser | Block-based | N/A | ✓ | ✕ |
| Pyret | Browser | Text-Based | Pyret | ✕ | ✕ |
| Quorum | Browser/Win/Mac | Text-Based | Quorum, MySQL | ✓ | ✕ |
| Scratch Data Blocks | Browser | Block-based | N/A | ✓ | ✕ |
| Snap! | Browser | Block-based | N/A | ✓ | ✕ |
| Tableau | Browser/Win/Mac | GUI | N/A | ✓ | ✕ |
| TinkerPlots | Win/Mac | GUI | N/A | ✓ | ✕ |

| Tools | Runtime Environment | Programming Modality | Scripting Language | Instructional Materials | Classroom Assignments |
|---|---|---|---|---|---|
| Tuva | Browser | GUI | N/A | ✓ | ✓ |

**Table 3: Supported Accessibility Features**

| Tools | Screen Reader Support | Color Palette | Simplified Representations | Customized Interactions | Font Size Modification |
|---|---|---|---|---|---|
| Blockly | ✕ | N/A | N/A | ✕ | ✕ |
| Blockly-DS | ✕ | ✓ | ✕ | ✕ | ✕ |
| BlocklySQL | ✕ | N/A | N/A | ✕ | ✕ |
| BlockPy | ✕ | ✓ | ✕ | ✕ | ✕ |
| Bridges CS | ✕ | ✓ | ✓ | ✕ | ✕ |
| CODAP | ✕ | ✓ | ✕ | ✕ | ✕ |
| DataClassroom | ✓ | ✓ | ✕ | ✕ | ✓ |
| Datacommons | ✕ | ✓ | ✕ | ✕ | ✕ |
| Dataland | ✕ | ✓ | ✕ | ✕ | ✕ |
| DBSnap | ✕ | N/A | N/A | ✕ | ✕ |
| EduBlocks | ✕ | ✓ | ✕ | ✕ | ✓ |
| GapMinder | ✕ | ✓ | ✓ | ✕ | ✓ |
| Google Colab | ✕ | ✓ | ✕ | ✕ | ✓ |
| GP | ✕ | N/A | N/A | ✕ | ✕ |
| iNZight | ✕ | ✓ | ✕ | ✕ | ✓ |
| iSnap | ✕ | N/A | N/A | ✕ | ✕ |
| JASP | ✕ | ✓ | ✕ | ✕ | ✓ |
| Jupyter Notebook | ✕ | ✓ | ✕ | ✕ | ✓ |
| Kaggle | ✕ | ✓ | ✕ | ✕ | ✕ |
| MakeCode Data Science Editor | ✕ | ✓ | ✕ | ✕ | ✕ |
| mBlock | ✕ | N/A | N/A | ✕ | ✕ |
| NetsBlox | ✕ | ✓ | ✕ | ✕ | ✕ |
| Playdata | ✕ | ✓ | ✕ | ✕ | ✕ |
| Pyret | ✕ | ✓ | ✕ | ✕ | ✓ |
| Quorum | ✕ | ✓ | ✕ | ✕ | ✕ |
| Scratch Data Blocks | ✕ | N/A | N/A | ✕ | ✓ |
| Snap! | ✕ | ✓ | ✕ | ✕ | ✕ |
| Tableau | ✕ | ✓ | ✕ | ✕ | ✕ |
| TinkerPlots | ✕ | ✓ | ✕ | ✕ | ✕ |
| Tuva | ✓ | ✓ | ✕ | ✕ | ✓ |