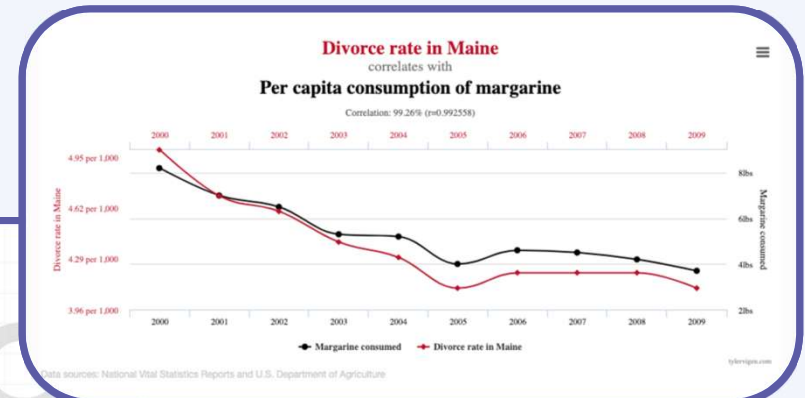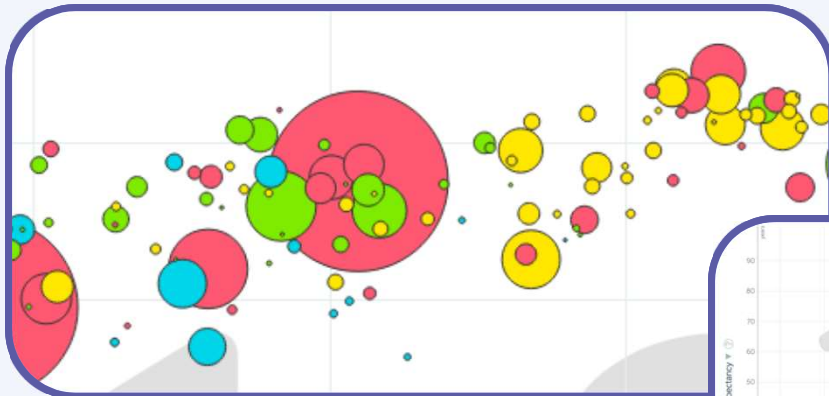# Year 9 Computer Science Data Science Knowledge Organiser

Key Word	Definition
Data Science	Extracting meaning from large data sets in order to gain insights to support decision-making.
Insight	The result of exploring data and reports in order to extract meaningful information.
Infographic	A visual representation of data, often involving pictures that reflect patterns and help tell a story.
Visualisation	A visual representation of data (such as charts and graphs) intended to help an audience process the information more easily and get a clear idea about the data at a glance.
Data	Facts and statistics collected together for reference or analysis.
Prediction	A statement about what someone thinks will happen in the future.
Criteria	A standard by which something can be judged or decided.
Outlier	A single data point that goes far outside the average value of a group of statistics.
Correlation	It measures the extent to which two variables are related.
PPDAC	Stands for five stages of project development: Problem, Plan, Data, Analysis, and Conclusion.
Investigative Cycle	A process that is used to carry out a statistical study.
Anomaly	A piece of data that, for one reason or another, doesn't fit with the rest of the results. It's often an indicator of something unexpected or problematic happening.
Data Source	The location where data that is being used originates from.
Data Capture	The process of extracting information from paper or electronic documents and converting it into data for key systems.
Analysis	The process of inspecting, cleansing, transforming, and modelling data with the goal of discovering useful information

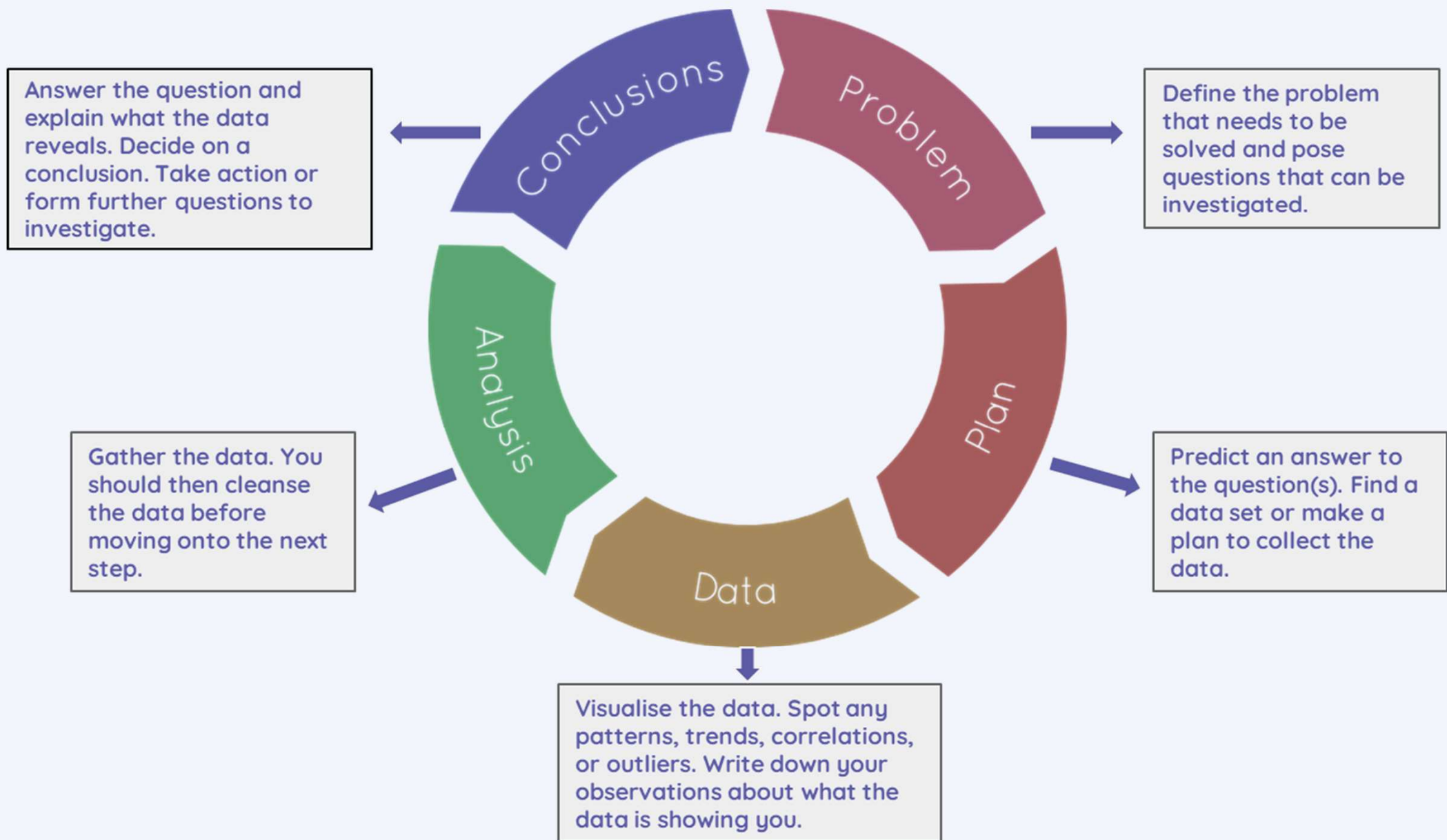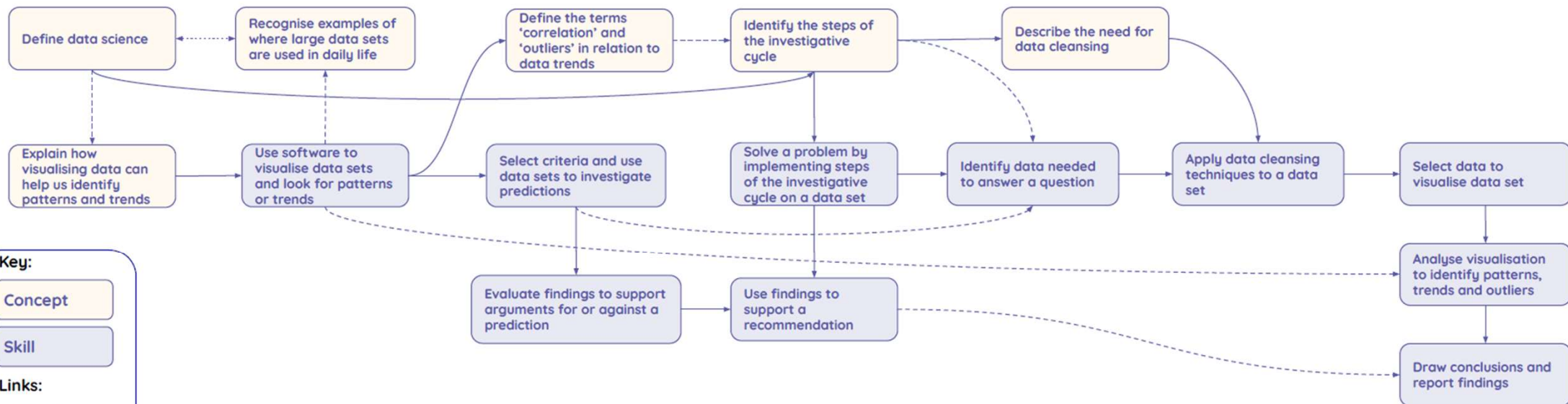| Key Word	Definition
Data Cleansing	Involves detecting and correcting, or removing, corrupt or inaccurate data.
Conclusion	A final decision or judgment an opinion or decision that is formed after a period of thought or research.

Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.

Dressée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite. Paris, le 20 Novembre 1869.

MOSCOU

TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.

Female astronauts in space

Number of astronauts

CANADA · CHINA · FRANCE · IRAN · ITALY · JAPAN · RUSSIA · SOUTH KOREA · SOVIET UNION · UNITED KINGDOM · UNITED STATES OF AMERICA

Impact

91% agree that the young people they reach have improved programming skills

89% agree that the young people they reach are more confident in their computer skills

89% agree that the young people they reach are more interested in programming and computers

86% agree that the young people they reach are better at solving problems with computers

81% agree that the young people they reach are more able to teach others computer skills

Clubs

How many young people typically attend your Code Club?

Average number of children at your club — 13

Proportion of girls at your club — 40%

What type of venue is your club held in?

What kinds of projects and resources do you use?

Do members usually have internet access at your club?

Do you use projects online or as printed worksheets?

Cambridge Theatre · St. Paul's Cathedral · WHITECHAPEL · CITY OF LONDON · COVENT GARDEN · Millennium Bridge · Wilton's Music Hall · Museum of London Docklands · CHARING CROSS · River Thames · Tower Bridge · London

Conclusions — Answer the question and explain what the data reveals. Decide on a conclusion. Take action or form further questions to investigate.

Problem — Define the problem that needs to be solved and pose questions that can be investigated.

Plan — Predict an answer to the question(s). Find a data set or make a plan to collect the data.

Data — Visualise the data. Spot any patterns, trends, correlations, or outliers. Write down your observations about what the data is showing you.

Analysis — Gather the data. You should then cleanse the data before moving onto the next step.

Assessment Rubric

	Emerging [1-3]	Expected [4-7]	Exceeding [8-10]	Score
Problem **(L4 A1)**	☐ Has attempted to provide a question that could be used to help solve the problem	☐ At least one question posed is appropriate to the scenario and can be investigated using data	☐ Has provided a minimum of two questions, both of which are appropriately framed and can be investigated further using data	
Plan **(L4 A2)**	☐ Has attempted to provide a prediction of what the answers to the questions will be ☐ Has produced a list of data that needs to be collected, some of which is suitable and relevant to the problem	☐ Has provided a sensible prediction as to what they think the answer to at least one of the questions will be ☐ Has produced a list of data that needs to be collected, most of which is suitable and relevant to the problem	☐ Has provided a sensible prediction as to what they think the answer to at least two of the questions will be ☐ Has produced a comprehensive list of data that needs to be collected, all of which is suitable and relevant to the problem	
Data **(L4 A3 & L5** **A1)**	☐ Has created a partially complete data capture form and has a small number of entries to analyse ☐ Has attempted to cleanse the data, but errors may still exist when it is analysed	☐ Has created an appropriate data capture form and collected data to analyse ☐ Has attempted to cleanse the data and correct or remove any errors	☐ Has created a fully appropriate data capture form and collected and has clearly spent time collecting a good set of data to analyse ☐ Has cleansed the data so that it is free from errors	
Analysis **(L5 A3 & L6** **A1)**	☐ Has created one or more visualisations, at least one of which attempts to use the data to answer the questions posed ☐ Little or no attempt has been made to analyse their findings	☐ Has created visualisations that compare at least two variables to help answer their questions ☐ Has written a sensible analysis of what they can learn from their findings	☐ Has visualisations to answer both questions that compare at least two variables to help answer their questions ☐ Has written a detailed and thoughtful analysis of what they can learn from their findings	
Conclusions **(L6 A2)**	☐ Has attempted a conclusion that makes at least one recommendation; recommendation may not be fully justified against their findings	☐ Has written a conclusion that reflects on their findings and makes a sensible recommendation as to what the next steps should be	☐ Has written a thoughtful and reflective conclusion that makes sensible recommendations as what the next steps should be; all recommendations are backed up by their findings	
			Total Score:	

Learning Graph

Define data science

Recognise examples of where large data sets are used in daily life

Define the terms 'correlation' and 'outliers' in relation to data trends

Identify the steps of the investigative cycle

Describe the need for data cleansing

Explain how visualising data can help us identify patterns and trends

Use software to visualise data sets and look for patterns or trends

Select criteria and use data sets to investigate predictions

Solve a problem by implementing steps of the investigative cycle on a data set

Identify data needed to answer a question

Apply data cleansing techniques to a data set

Select data to visualise data set

Evaluate findings to support arguments for or against a prediction

Use findings to support a recommendation

Analyse visualisation to identify patterns, trends and outliers

Draw conclusions and report findings

Key:

Concept

Skill

Links:

Direct prerequisite

Scaffolding not direct prerequisite