## Science Steps 9-1

| Step | AO1 (Demonstrate knowledge) | AO2 (Apply) | AO3 (Analyse & Evaluate) | AO4 (Scientific literacy) |
|---|---|---|---|---|
| | *Demonstrate Knowledge and understanding of:*<br>• *Scientific ideas*<br>• *Scientific techniques and procedures* | *Apply Knowledge and understanding of:*<br>• *Scientific ideas*<br>• *Scientific techniques and procedures* | *Analyse information and ideas to:*<br>• *Interpret & evaluate*<br>• *Make judgements & draw conclusions*<br>• *Develop & improve experimental procedures* | *Vocabulary, units, symbols, nomenclature, spelling, punctuation & grammar* |
| 8 | Learners recall, select and communicate **comprehensive** and **precise** knowledge and detailed understanding of science. They **always** demonstrate a **comprehensive** understanding of the nature of science, its laws, its applications, and the influences of society on science and science on society. They understand the relationships between scientific advances, their ethical implications and the benefits and risks associated with them. They use scientific and technical knowledge, terminology and conventions **appropriately and consistently,** showing a **detailed** understanding of scale in terms of time, size and space. | They **always** apply **appropriate** knowledge and understanding effectively in a **wide range** of practical and other contexts. They show a **detailed and comprehensive** understanding of the relationships between hypotheses, evidence, theories and explanations and make **effective** use of models to explain phenomena, events and processes. They use a **wide range** of appropriate methods, sources of information and data consistently, **applying relevant skills** to address scientific questions, solve problems and test hypotheses. Learners make effective use of a range of quantitative relationships between variables and calculations or when using data to support evidence. | Learners analyse, interpret and critically evaluate a **broad range** of quantitative and qualitative data and information. They evaluate information **from a wide range of sources systematically** to develop arguments and explanations taking account of the limitations of the available evidence. They make **reasoned judgments** consistently and **draw detailed, evidence-based conclusions.** They communicate findings and arguments showing their awareness of the degree of uncertainty. | They apply appropriate skills, including communication and mathematical skills,<br>• Sentence demarcation is precise and effective<br>• Wide range of punctuation is used with a high level of accuracy and for impact<br>• Sentences forms are applied judiciously for impact<br>• Uses Standard English precisely with secure control of complex grammatical structures<br>• Spelling is precise throughout<br>• Extensive, ambitious and judicious use of vocabulary |

| | | | |
|---|---|---|---|
| **7** | Learners recall, select and communicate **precise** knowledge and detailed understanding of science. They demonstrate a **comprehensive** understanding of the nature of science, its laws, its applications, and the influences of society on science and science on society. They understand the relationships between scientific advances, their ethical implications and the benefits and risks associated with them. They use scientific and technical knowledge, terminology and conventions **appropriately and consistently,** showing a **detailed** understanding of scale in terms of time, size and space. | They apply **appropriate** knowledge and understanding effectively in a **wide range** of practical and other contexts. They show a **comprehensive** understanding of the relationships between hypotheses, evidence, theories and explanations and make **effective** use of models to explain phenomena, events and processes. They use a **wide range** of appropriate methods, sources of information and data consistently, **applying relevant skills** to address scientific questions, solve problems and test hypotheses. Learners make effective use of a range of quantitative relationships between variables and calculations or when using data to support evidence. | Learners analyse, interpret and critically evaluate a **broad range** of quantitative and qualitative data and information. They evaluate information s**ystematically** to develop arguments and explanations taking account of the limitations of the available evidence. They make **reasoned judgments** consistently and **draw detailed, evidence-based conclusions.** They communicate findings and arguments showing their awareness of the degree of uncertainty. | They apply appropriate skills, including those learnt in other subjects for example communication and mathematical skills, Sentence demarcation is consistently secure and consistently accurate Wide range of punctuation is used with a high level of accuracy Uses a full range of appropriate sentence forms for effect Uses Standard English consistently and appropriately with secure control of complex grammatical structures High level of accuracy in spelling, including ambitious vocabulary • Extensive and ambitious use of vocabulary Learners make records of relevant observations and comparisons clearly identifying points of particular significance. They decide the level of precision needed for measurements and collect data that satisfy these requirements. They analyse findings to interpret trends and patterns and draw conclusions form their evidence. They communicate findings and arguments showing their awareness of the degree of uncertainty. |

| 6 | Learners recall, select and communicate **detailed** knowledge and detailed understanding of science. They demonstrate a **detailed** understanding of the nature of science, its laws, its applications, and the influences of society on science and science on society. They understand the relationships between scientific advances, their ethical implications and the benefits and risks associated with them. They **usually** use scientific and technical knowledge, terminology and conventions appropriately and consistently, showing a **clear** understanding of scale in terms of time, size and space. | They apply appropriate knowledge and understanding effectively in a **wide** range of practical and other contexts. They show a **detailed** understanding of the relationships between hypotheses, evidence, theories and explanations and **make use** of **simple** models to explain phenomena, events and processes. They use a **range** of appropriate methods, sources of information and data consistently, applying **a range of** skills to address scientific questions, solve problems and test hypotheses. | Learners analyse, interpret and critically evaluate a **broad** range of quantitative and qualitative data and information. They **evaluate** information to develop arguments and explanations taking account of **some** limitations of the available evidence. **They make reasoned judgments and draw evidence-based conclusions.** Learners analyse data and begin to explain and allow for anomalies | They apply appropriate skills, including those learnt in other subjects for example communication and mathematical skills Sentence demarcation is secure and accurate with rare and minor error Wide range of punctuation is used with rare and minor error Attempts a full range of appropriate sentence forms for effect Uses Standard English consistently with control of complex grammatical structures High level of accuracy in spelling, including ambitious vocabulary Extensive and ambitious use of vocabulary.<br><br>Learners carry out multi step calculations and use compound measures such as speed appropriately. They communicate findings and arguments showing awareness of a range of views. |

| | | | |
|---|---|---|---|
| **5** | Learners recall, select and communicate **secure** knowledge and understanding of science. They demonstrate **understanding** of the nature of science, its laws, its applications and the influences of society on science and science on society. They understand how scientific advances may have ethical implications, benefits and risks. They use scientific and technical knowledge, terminology and conventions **appropriately,** showing understanding of scale in terms of time, size and space. | They apply **appropriate** skills, including communication, mathematical and technological skills, knowledge and understanding in a **range** of practical and other contexts. They **recognise, understand** and use **straightforward links** between hypotheses, evidence, theories, and explanations. They use models to explain phenomena, events and processes. Using **appropriate** methods, sources of information and data, they apply their **skills** to answer scientific questions, solve problems and test hypotheses. | Learners analyse, interpret and evaluate a range of quantitative and qualitative data and information. They understand the limitations of evidence and develop arguments with supporting explanations. They draw conclusions consistent with the available evidence. They begin to consider whether the data they have collected are sufficient for the conclusions they have drawn. | They usually apply appropriate skills, including those learnt in other subjects for example communication and mathematical skills <br> they use scientific & technical terminology and conventions appropriately showing understanding of scale in terms of time, size and space. Sentence demarcation is mostly secure and mostly accurate <br> Range of punctuation is used, mostly with success <br> Uses a variety of sentence forms for effect <br> Mostly uses Standard English appropriately with mostly controlled grammatical structures <br> Generally accurate spelling, including complex and irregular words <br> Increasingly sophisticated use of vocabulary <br> Learners record data in graphs using lines of best fit. <br> They communicate effectively using a wide range of scientific and technical conventions and terminology including symbols and flow diagrams. |
| **4** | Learners recall, select and communicate knowledge and understanding of science. They demonstrate **some understanding** of the nature of science, its laws, its applications and the influences of society on science and science on society. They understand how scientific advances may have ethical implications, benefits and risks. They **usually** | They apply skills, including communication, mathematical and technological skills, knowledge and understanding in a **limited range** of practical and other contexts. They **recognise** and use **straightforward links** between hypotheses, evidence, theories, and explanations. They use models to explain phenomena, events and processes. Using **appropriate** methods, sources of information and data, | Learners analyse, interpret and evaluate a limited range of quantitative and qualitative data and information. They understand the limitations of evidence and develop arguments with supporting explanations. They draw **limited** conclusions consistent with the available evidence. | They usually apply appropriate skills, including those learnt in other subjects for example communication and mathematical skills <br> Sentence demarcation is mostly secure and more often than not is accurate <br> Range of punctuation is attempted <br> Uses a variety of sentence forms accurately <br> Mostly uses Standard English with evidence of controlled grammatical structures <br> Generally accurate spelling, including some complex words <br> Some ambitious vocabulary attempted <br> Learners can record data and features effectively choosing scales for graphs and diagrams. They can manipulate numerical |

| | | | | |
|---|---|---|---|---|
| | use scientific and technical knowledge, terminology and conventions **appropriately,** showing understanding of scale in terms of time, size and space. | they apply their **skills** to answer scientific questions, solve problems and test hypotheses. | | data to make valid comparisons and draw valid conclusions. They communicate qualitative and quantitative data effectively using scientific conventions and terminology. |
| 3 | Learners recall, select and communicate **basic** knowledge and understanding of science. They demonstrate **basic understanding** of the nature of science, its laws, its applications and the influences of society on science and science on society. They understand how scientific advances may have ethical implications, benefits and risks. They **occasionally** use scientific and technical knowledge, terminology and conventions **appropriately,** showing understanding of scale in terms of time, size and space. | They apply **basic** skills, including communication, mathematical and technological skills, knowledge and understanding in a **limited range of** practical and other contexts. They **recognise straightforward links** between hypotheses, evidence, theories, and explanations. They use models to explain phenomena, events and processes. Using **appropriate** methods, sources of information and data, they apply their **skills** to answer scientific questions, solve problems and test hypotheses. | Learners analyse, interpret and evaluate a range of **basic** quantitative and qualitative data and information. They understand the limitations of evidence and develop arguments with supporting explanations. They **attempt** to draw conclusions consistent with the available evidence. | Sentence demarcation is mostly secure and sometimes accurate<br> Some control of a range of punctuation<br> Attempts a variety of sentence forms<br> Some use of Standard English with some control of agreement<br> Some accurate spelling of more complex words<br> Varied use of vocabulary<br>Learners use line graphs to present data,, interpret numerical data and draw conclusions from them.<br>Learners can communicate these using Scientific and mathematical conventions and terminology |
| 2 | Learners recall, select and communicate their **limited knowledge** and understanding of science. They have a **limited** understanding that specific advances may have ethical implications, benefits and risks. | They apply skills, including **limited** communication, mathematical and technological skills, knowledge and understanding in practical and **some other contexts**. They show **limited** understanding of the nature of | Learners interpret and evaluate **some qualitative and quantitative** data and information from a limited range of sources. They can draw **elementary conclusions** having **collected limited evidence.** | Basic sentence demarcation is sometimes accurate<br> Basic control of some punctuation<br>Attempts some simple and complex sentence forms<br>Basic use of Standard English with some agreement<br>Attempt accurate spelling of some complex words<br> Basic but varied use of vocabulary |

| | | | | |
|---|---|---|---|---|
| | They recognise simple inter relationships between science and society. They **use limited scientific** and technical knowledge, terminology and conventions, showing **some understanding** of scale in terms of time, size and space. | science and its applications. They can **explain straightforward models** of phenomena, events and processes. Using a **limited** range of skills and techniques, they answer scientific questions, solve straightforward problems and test ideas. | | Record observations, comparisons and measurements using tables and bar charts and begin to plot points to form simple graphs. Learners can interpret data containing positive and negative numbers. Learners can communicate conclusions using appropriate scientific language. |
| **1** | Learners recall, select and communicate their **limited knowledge** and understanding of science. They recognise simple inter relationships between science and society. They **use limited scientific** and technical knowledge, terminology and conventions, showing **some understanding** of scale in terms of time, size and space. | They apply skills, including **limited** communication, mathematical and technological skills, knowledge and understanding in **practical contexts.** They show very **limited** understanding of the nature of science and its applications. Using a **very limited** range of skills and techniques, they answer scientific questions, solve straightforward problems and test ideas. | Learners attempt to interpret and evaluate **their own experimental results and methods.** They can draw **elementary conclusions** having **collected limited evidence.** | Occasional use of sentence demarcation Some evidence of conscious punctuation Simple range of sentence forms Occasional use of Standard English with limited control of agreement Accurate basic spelling Simple use of vocabulary Record observations, comparisons and measurements using tables and bar charts and begin to plot points to form simple graphs. Learners can communicate conclusions using appropriate scientific language. |
| **R** | Learners **usually** recall, select and communicate their **limited knowledge** and understanding of science. They **usually use limited scientific** and technical knowledge, terminology and conventions, showing **some understanding** of scale in terms of time, size and space. | They **usually** apply skills, including **limited** communication, mathematical and technological skills, knowledge and understanding in **practical contexts.** They show very **limited** understanding of the nature of science and its applications. **usually** Using a **very limited** range of skills and techniques, they answer scientific questions, solve straightforward | Learners **usually** interpret and evaluate **their own experimental results and methods.** They can **usually** draw **elementary conclusions** having **collected limited evidence.** | Limited use of sentence demarcation Limited evidence of punctuation Limited sentence forms Limited use of Standard English Some basic spelling Limited use of vocabulary Record observations, comparisons and measurements using tables and bar charts and begin to plot points to form simple graphs. Learners cannot communicate conclusions using appropriate scientific language. |

| | | | | |
|---|---|---|---|---|
| | | problems and test ideas. | | |
| **S** | Learners **are beginning to** recall, select and communicate their **limited knowledge** and understanding of science. They **are beginning to use limited scientific** and technical knowledge, terminology and conventions, **beginning to show some understanding** of scale in terms of time, size and space. | They **are beginning to** apply skills, including **limited** communication, mathematical and technological skills, knowledge and understanding**.** They **are beginning to** show very **limited** understanding of the nature of science and its applications. Using a **very limited** range of skills and techniques, they answer scientific questions. | Learners **are beginning to** attempt to interpret and evaluate **their own experimental results and methods.** They **are beginning to** draw **elementary conclusions** having **collected limited evidence.** | Vague use of sentence demarcation Vague evidence of punctuation Vague sentence forms Vague use of Standard English Vague attempt at basic spelling Vague use of vocabulary Record observations, comparisons and measurements using tables and bar charts Learners cannot communicate conclusions using appropriate scientific language. |
| **G** | Learners cannot recall, select and communicate their **knowledge** and understanding of science. They cannot **use scientific** and technical knowledge, terminology and conventions, showing **no understanding** of scale in terms of time, size and space. | They cannot apply skills, including communication, mathematical and technological skills, knowledge and understanding. They show no understanding of the nature of science and its applications. | Learners cannot interpret and evaluate **their own experimental results and methods.** They cannot draw **elementary conclusions** or **collect limited evidence.** | Incompetent use of sentence demarcation Incompetent evidence of punctuation Incompetent sentence forms Incompetent use of Standard English Incompetent attempt at basic spelling Incompetent use of vocabulary Cannot Record observations, comparisons and measurements using tables and bar charts and cannot plot points to form simple graphs. Learners cannot communicate conclusions using appropriate scientific language. |