Grade 4 Scientific Literacy Provincial Assessment 2018-2019
Performance Feedback by Outcomes/Standards

Initiate & Plan	
PP1 – Propose Testable Questions/Problems ➢ Ask questions that lead to an investigation. ➢ Identify practical problems to be solved. ➢ Write questions using language that suggests the variable to be tested and the variable to be measured/observed. ➢ May use language of "better" or "improve".	• Most students can identify a testable question written in standard form about familiar topics. • Many students can identify a testable question written in standard form about unfamiliar topics. • Only some stronger students are able write testable questions that suggest the two variables are related.
PP2 – State a Prediction and Hypothesis ➢ Make a prediction based on an observed pattern of events. ➢ Predictions are related to a problem or question. ➢ Prediction statements are written using the "If, then, because" format. ➢ Prediction statements are testable, but variables may not be specific enough to measure.	• Most stronger students can make a prediction based on an observed pattern of events.
PP3 – Identify and Describe Variables ➢ Identify and list variables to be measured or observed that relate to the question or problem. ➢ Select one variable to be tested that relates to the question. ➢ Identify and control major variables in the investigation.	• Most students can identify the variable being measured in a written testable question. • Many students can identify the variable being measured in an investigation. • Some strong students can identify the variable being tested in an investigation. • Some students can list variables that can be measured or observed related to a question.
PP4 – Plan Investigations ➢ Identify appropriate tools and materials to complete an investigation or solve a problem. ➢ Describe what will be measured/observed and how/when it will be recorded. ➢ Plan a set of steps to solve a problem or carry out a fair test.	• Most students can identify next step in a procedure. ➢ Many students can identify the missing step in a procedure. ➢ Some students can identify the best investigation procedure. • Some students can describe that multiple trials leads to more accurate results.

Grade 4 Scientific Literacy Provincial Assessment 2018-2019
Performance Feedback by Outcomes/Standards

Perform	
PP5 – Conduct Investigations ➢ Follow the procedure. ➢ Safely use materials and tools. ➢ Make relevant observations and measurements for a testable question or problem. ➢ Record observations and measurements; using lists, tallies, diagrams, and charts.	• Many students don't know the word observation. • Most students struggle with the difference between observations and inferences. • Many students do not understand that they cannot use their prior knowledge to make observations. • Some students struggle to use measurement tools (scale, rulers, measuring cups, thermometers, timers). • Students struggle to use descriptive language when observing objects or organisms.
AE1 – Classify, Organize & Display Data ➢ Classify items or organisms according to characteristics that are the same or different. ➢ Create a chart or diagram that shows the method of classification. ➢ Organize and display data accurately using a chart, table, or bar graph. ➢ Label columns, rows, and titles for tables, charts, and diagrams. ➢ Use appropriate scale (one-to-one, or many-to-one), title the graph, label the x- and y-axis including units, and include a legend where appropriate.	• Most students can identify how a group of common objects or organisms were classified. • Most students can organize a group of common organisms or objects into pre-determined groups. • Many students struggle to come up with their own way to sort common organisms or objects. • Most students do not use specific vocabulary to sort the objects or organisms into groups. • Most students can identify the table that belongs to a given graph. • Many students can transfer data from a graph and re-write the data into a table. • Many students make mistakes when using a many-to-one scaling on a graph as they struggle to read the numbers between the lines. • Many students struggle to understand the difference between a bar graph and a histogram. • Most students make several errors when creating a bar graph; such as scaling errors and leaving out values. • Some strong students can create bar graphs that include all relevant details.

Grade 4 Scientific Literacy Provincial Assessment 2018-2019
Performance Feedback by Outcomes/Standards

Analyze & Explain	
AE2 – Analyze Data ➢ Identify a general pattern, trend, and/or relationship in data. ➢ Suggest explanations for pattern, trend, or relationship. ➢ Identify discrepancies in data. ➢ Suggest explanations for discrepancies (possible sources of error).	• Most students can identify a general relationship in data found on a chart or a graph. • Most students can use a pattern on a graph to identify a missing value. • Many students struggle to use a pattern in a chart to identify a missing value. • Many students can identify possible reasons for a discrepancy in data. • Most students struggle to suggest explanations for a pattern, trend, or relationship in data.
AE3 – Drawing Conclusions ➢ Suggest a conclusion that answers the initial question. ➢ Provide evidence from data collected to support the conclusion. ➢ Indicate if the prediction is supported or not supported. ➢ Suggest improvements to the investigation. ➢ Evaluate a prototype with respect to its function, reliability, safety, appearance, and use of materials. ➢ Suggest improvements to a prototype.	• Some students can identify a conclusion that answers the initial question.
AE4 – Apply Learning ➢ Develop new questions or problems to investigate from what was learned. ➢ Identify potential applications of findings (results). ➢ Evaluate the usefulness of different information sources in answering the given question or problem.	• Limited data available.

Initiate & Plan	
PP1 – Propose Testable Questions/Problems ➢ Write testable questions that use language that suggests an investigation of two variables that are related. ➢ Testable questions specifically indicate the independent variable (variable to be tested) and the dependent variable (variable to be measured/observed). ➢ Identify practical problems to solve.	• Most students can identify a testable question written in standard form about familiar topics. • Many students can identify a testable question written in standard for unfamiliar topics. • Most students struggle with identifying a testable question when it is not in standard form. • Only some strong students can write a testable question.
PP2 – State a Prediction and Hypothesis ➢ Make a prediction that show the relationship between two variables based on previous experience and knowledge. ➢ Prediction statements are written using the "If, then, because" format. ➢ Prediction statements are testable including variables that are specific enough to measure.	• Most students can make a prediction based on information provided.
PP3 – Identify and Describe Variables ➢ Distinguish between independent (tested), dependent (measured/observed), and control variables. ➢ Identify specific variables to measure that related to the variable being tested. ➢ Identify specific variables to be controlled related to the independent and dependent variables.	• All students struggle with identifying a specific type of variable (control, independent, and dependent variables). • Most stronger students understand a controlled variable. • All students struggle with the scientific vocabulary of independent and dependent variables. • Many students still struggle with the vocabulary of testing and measuring variables. • Many students struggle with writing specific variables related to the testable question.
PP4 – Plan Investigations ➢ Identify appropriate tools and materials. ➢ Describe what will be measured/observed and how/when it will be recorded. ➢ Write detailed step by step procedures. ➢ Procedures use specific language and ensure safety. ➢ Includes multiple trials (when appropriate).	• Most students can identify the next step for a straight forward list of steps. • Many students struggle to identify the next step when instructions are written in a paragraph. • All students struggle with the importance of conducting multiple trials in a fair test. • All students struggle with writing detailed step by step procedures. • All students struggle to include what will be measured/observed in their investigations.

Grade 6 Scientific Literacy Provincial Assessment 2018-2019
Performance Feedback by Outcomes/Standards

Perform	
PP5 – Conduct Investigations ➢ Use tools safely when manipulating materials, building models, and taking measurements. ➢ Set up an investigation and follow the procedure. ➢ Make relevant observations and measurements for testable question or problem. ➢ Record observations and measurements; using lists, diagrams, and charts.	• Many students struggle with the difference between observations and inferences. • Many students do not understand that they cannot use their prior knowledge to make observations. • Some students are unable to use displacement to determine the volume of a solid. • Some students are unable to select the appropriate tool to take a measurement in a given situation.
AE1 – Classify, Organize & Display Data ➢ Classify items or organisms according to characteristics that are the same or different. ➢ Create a chart or diagram that shows the method of classification ➢ Organize and display data accurately using the appropriate type of chart or graph. ➢ Label columns and rows (table, Carroll diagram) or areas (Venn diagram) accurately and include a chart title. ➢ Title the graph, label the x- and y-axis including units, and include a legend where appropriate.	• Most students can identify the appropriate data table/graph for the data given. • Most students can identify an appropriate way to classify items/organisms. • All students struggle with making proper graphs from data tables (titles, scales, legends, plotting data). • All students struggle with displaying data/information in a variety of ways (Venn diagrams, tables, charts, graphs, webs, keys).

Grade 6 Scientific Literacy Provincial Assessment 2018-2019
Performance Feedback by Outcomes/Standards

Analyze & Explain	
AE2 – Analyze Data ➢ Identify patterns, trends, and/or relationships in data. ➢ Suggest explanations for patterns, trends, and/or relationships in data. ➢ Identify discrepancies in data. ➢ Suggest explanations for discrepancies (possible sources of error).	• Most students can identify a possible reason for differences in data. • Most students can predict what will happen next based on data trend. • Most students can analyze different data forms (charts, keys, webs) to answer a question. • Struggling students are not able to interpret information/data found in different forms (charts, graphs, keys, webs, Venn diagrams) to answer a question. • Many students struggle with articulating and explaining the differences/discrepancies found in data.
AE3 – Drawing Conclusions ➢ Draw a conclusion that answers the initial question. ➢ Indicate whether the data supports, refutes or is inconclusive about the initial prediction. ➢ Justify the conclusion by providing evidence from data collected. ➢ Compare the results to those of others and explain why results may vary. ➢ Discuss fairness of experimental design and suggest improvements for a follow-up investigation. ➢ Evaluate a design/prototype with regards to its function, reliability, safety, efficiency, use of materials, and impact on the environment ➢ Suggest improvements to a design/prototype.	• Most students can identify a proper justification to a conclusion. • Most students can identify an appropriate way to improve on an experimental design. • Most students can compare results and identify a reason why the results vary. • Most students struggle to explain possible reasons for differences in results. • Most students struggle to write a conclusion that uses evidence to back up their claim.
AE4 – Apply Learning ➢ Develop new questions or problems to investigate. ➢ Apply what has been learned to other situations. ➢ Evaluate sources of information for relevancy and reliability. ➢ Compare findings to other scientific investigations and/or knowledge.	• Lower students struggle to identify the relevance & reliability of sources. • Most students struggle with reading a scenario and then applying this information to draw a reasonable conclusion or come up with a possible solution.

Grade 10 Scientific Literacy Provincial Assessment 2018-2019
Performance Feedback by Outcomes/Standards

Initiate & Plan	
PP1 – Propose Testable Questions/Problems ➢ Identify questions or problems to investigate. ➢ Write testable questions that use language that suggests the investigation of two variables that are related. ➢ Testable questions specifically indicate the independent variable and the dependent variable. ➢ Define and delimit the problem to be solved. ➢ Use language that is precise and relevant to the question or problem.	• Most students can identify a testable question written in standard form based off a given data table. • Most students struggle with identifying a testable question that is not in standard form.
PP2 – State a Prediction and Hypothesis ➢ Write hypothesis that is testable with variables that are specific enough to measure. ➢ Hypothesis are based on prior experience, knowledge, and/or research. ➢ Hypothesis are written using the "If, then, because" format. ➢ Hypothesis are written in the third person.	• Limited data available.
PP3 – Identify and Describe Variables ➢ Distinguish between independent, dependent, and control variables. ➢ Select one independent variable, create a list of possible dependent variables (and how to measure them). ➢ Identify specific variables to be controlled related to the independent and dependent variables.	• Most students can identify the variable being manipulated. • Most student struggle with the scientific vocabulary of independent and dependent variables. • Most students struggle to identify control variables. • Most students struggle with writing specific variables related to the testable question. • Most students struggle when needing to create a list of control variables for a given situation.
PP4 – Plan Investigations ➢ Identify appropriate tools and materials. ➢ Describe what will be measured/observed and how/when it will be recorded. ➢ Write detailed step by step procedures. ➢ Procedures use specific language and ensure safety. ➢ Includes multiple trials and control groups when appropriate.	• Most students can identify the best procedure to follow for a given situation. • Many students can identify what/how should be measures/observed during an investigation. • Most students struggle to plan a detailed experiment which includes identifying tools/material being used, describing what/how/when something is observed/measured, and using specific language to write details step by step procedure. • Most students struggle to understand that multiple trials increase the reliability and accuracy of results and helps to identify discrepancies in data.

Grade 10 Scientific Literacy Provincial Assessment 2018-2019
Performance Feedback by Outcomes/Standards

Perform	
PP5 – Conduct Investigations ➢ Use tools safely and accurately when manipulating materials, building models, and taking measurements. ➢ Set up an investigation and follow the procedure. ➢ Make relevant observations and measurements for testable question or problem. ➢ Record observations and measurements accurately; using lists, diagrams, and charts.	• Most students can identify the volume of a solid or liquid using measurement tool and calculations. • Some students can take the measurement of a very small object or organism using a microscope micrometer. • Most students can accurately measure an object using measuring tools. • Many students struggle with identifying an accurate measuring tool for a given situation.
AE1 – Classify, Organize & Display Data ➢ Classify items or organisms according to characteristics that are the same or different. ➢ Use or construct classification keys. ➢ Organize and display data accurately using in a variety of formats; diagrams, flow charts, tables, and graphs. ➢ Include titles, labels, units, and legends where appropriate. ➢ Identify strengths and weaknesses of different methods of collecting and displaying data.	• Most students struggle to use a classification key. • Most students struggled to calculate the average for a set of data that was to be displayed graphically. • Many students did not include all the specific details for their graphs; titles, labels, units. • Many students created graphs with the incorrect scales.

Analyze & Explain	
AE2 – Analyze Data ➢ Identify patterns, trends, and/or relationships in data. ➢ Suggest explanations for patterns, trends, and/or relationships in data. ➢ Predict the value of a variable by interpolating and extrapolating from a graph. ➢ Identify discrepancies in data. ➢ Suggest explanations for discrepancies (possible sources of error). ➢ Suggest a reasonable amount of error in a measurement.	• Most students can identify the graph that represents the relationship/trend/pattern for simple data. • Many students struggle to identify the graph that represents the relationship/trend/pattern for more complex data. • Most stronger students can identify the pattern/trend/relationship found in a graph showing more than one set of data within the graph. • Many students struggle to make comparisons between data represented in various graphical formats. • Most students struggle to identify explanations for patterns, trends, and/or relationships in data. • Most students can predict the value of a variable by interpolating and extrapolating from a graph. • Most students struggle to identify explanations for discrepancies in data • Most students struggle to suggest explanations for trends/patterns/relationships in data.
AE3 – Drawing Conclusions ➢ State a conclusion that answers the initial question. ➢ Indicate whether the data supports, refutes or is inconclusive about the initial hypothesis. ➢ Justify the conclusion by providing evidence from data collected. ➢ Compare the results to those of others and explain why results may vary. ➢ Discuss fairness of experimental design and suggest improvements for a follow-up investigation. ➢ Evaluate a design/prototype with regards to its function, reliability, safety, efficiency, use of materials, and impact on the environment ➢ Suggest improvements to a design/prototype.	• Most students can identify the evidence that supports a given conclusion. • Some students can suggest improvements to the design of an experiment that are plausible and detailed.
AE4 – Apply Learning ➢ Develop new questions or problems to investigate. ➢ Identify and evaluate potential applications of findings. ➢ Evaluate sources of information for relevancy and reliability.	• Most students can identify the potential application of the findings.