Student Profile: Science Inquiry Learning Grades PreK-4

Student:_____

DOB:_____

Date of Entry:_____ Re-entry:_____

Year	Grade	Teacher	Support Service Provider	Case Manager

The Student Profile for Science Inquiry Learning provides a guide for instructional planning, progress monitoring, and documentation of essential learning of science inquiry skills and concepts within and across grades PreK-4. The science skills and concepts listed have been integrated with consideration of developing literacy and numeracy skills at these grade levels.

At the end of each school year, samples of student work in science could accompany this record when the Profile is passed on to the next year's teacher. When including a sample of student work, *label the student work* with the inquiry indicator letter (e.g., "C" for Conducting Investigations) and the corresponding skills/concepts number(s) assessed with that assessment. (Note that numbers are for ease of use and relate to a general progression, not a specific intended skill sequence. For example, PreK-K skills generally develop before the grade 1 skills and concepts.) Also *list the assessment tool* (by name or description) *under column H* with coding notes (e.g., "Ice Melt Performance Task" – A10, A11, C13, C14, D12, D13). Be sure the student work is dated (e.g., 10/2007); and indicate *which domain of science* (Earth & Space, Physical, or Life Science) is being assessed with this assessment.

DIRECTIONS for Documenting Progress:

/ in the box indicates the skill/concept has been introduced, but the student has not yet demonstrated conceptual understanding or consistently applied the skill *in the context of an investigation*. It may be necessary to: scaffold instruction; re-teach the concept using another approach or another context/investigation; or re-assess acquisition of skills/concepts at earlier levels if not yet mastered. Administering formative assessments prior to conducting extended investigations is highly recommended to guide instructional planning and appropriate timing of the summative assessments.

X in the box indicates the student has met expectations for this grade level, meaning that there is *sufficient evidence* (assessment data from multiple formats – teacher observations, formative assessments, performance tasks, etc.) to support this conclusion.

Science Inquiry	A Is the student developing an awareness and curiosity about objects, organisms, and events in the environment?	B Is the student developing the ability to plan and analyze simple investigations to test predictions/answer questions?	C To what extent is the student developing skills of observing, measuring, recording, organizing, and summarizing data?
Grade Levels	***Formulating Questions & Hypothesizing***	***Planning & Critiquing Investigations***	***Conducting Investigations***
Grades PreK-K	☐ 1. Sustains curiosity and focus during teacher-guided explorations ☐ 2. Sustains curiosity and focus during open-ended & self-guided explorations ☐ 3. Answers questions about things observed, manipulated, or predicted ☐ 4. Uses picture cues, prior knowledge, and observations to make predictions ☐ 5. Formulates questions about things observed or manipulated when cued (e.g., what do you wonder?) or on own	☐ 1. Selects materials and objects for open-ended explorations ☐ 2. Works with others to generate simple testable questions (Does it sink) ☐ 3. Works with others to plan how to answer simple testable questions: What tools/materials to use How to "collect" data Where/how to record data Safety rules	☐ 1. Uses multiple senses to collect data/ make observations *with teacher guidance* ☐ 2. Uses simple tools (e.g., magnifier, scale) to gather data *with teacher guidance* ☐ 3. Uses nonstandard units, numbers, words, drawings to record observations ☐ 4. Identifies differences in observable characteristics of materials or events ☐ 5. Identifies similarities in observable characteristics of materials or events ☐ 6. Drawings show some details (size, color)
Grade 1	☐ 6. Asks questions about things that can be observed or manipulated (how far...) ☐ 7. Connects prior knowledge/evidence to observations and predictions ☐ 8. Identifies variable to change/test (e.g., what if …more or less water?)	☐ 4. Works with others to generate simple testable questions ☐ 5. Identifies potential data to collect and tools & materials needed ☐ 6. Works with others to develop major steps to follow to collect & record data	☐ 7. Follows steps of a plan *with guidance* ☐ 8. Uses tools & senses to make observations ☐ 9. Drawings show detail of 'target' features (size, color, shape, numbers, proportions) ☐ 10. Records similarities & differences in teacher-provided tables/charts/templates
Grade 2	☐ 9. Poses observational questions (e.g., compare differences in speed) ☐ 10. Uses prior knowledge/evidence to explain logical predictions ☐ 11. Identifies variable to change/test ☐ 12. Generates new inquiry questions	☐ 7. Works with others to write a plan to answer observational questions ☐ 8. Identifies data to collect and tools and materials needed ☐ 9. Explains safety rules and (steps) procedure for data collection	☐ 11. Follows a plan to conduct investigations ☐ 12. Uses tools & senses to collect data ☐ 13. Drawings show detail & completeness (relative proportions, key features, labels) ☐ 14. Explains similarities & differences ☐ 15. Organizes, labels, & titles graphs/charts
Grade 3	☐ 13. Poses cause-effect questions ☐ 14.Uses observations and evidence to explain predictions (e.g., data patterns, cause-effect observations) ☐ 15. Describes variables that affect systems using "if-then" statements	☐ 10. Develops a sequential plan to test a prediction/answer a question ☐ 11. Identifies tools, materials, and equipment needed and data to collect ☐ 12. Explains how to ensure a "fair test" (e.g., variables to control, methods) & identifies potential design flaws	☐ 16. Records & labels data (e.g., units of measure, labels & titles, trials, order) ☐ 17. Drawings are detailed, complete, keyed ☐ 18. Select appropriate representations to display data graph, table) and observations ☐ 19. Follows and explains procedures ☐ 20. Interprets data: describes results, makes connections to prediction
Grade 4	☐ 16. Connects observations to a question ☐ 17. Connects observations to prediction ☐ 18. Makes reasonable predictions based on available evidence ☐ 19. Supports prediction or question with an explanation ☐ 20. Analyzes scientific data about systems to generate questions or predictions (showing cause-effect relationships)	☐ 13. Identifies types of evidence that answer a question or tests a prediction ☐ 14. Develops a step-by-step plan to answer a question/ test a prediction ☐ 15. Explains why a procedure is/ is not a "fair test" (e.g., control of variables, multiple trials, data collection method) ☐ 16. Explains appropriateness of use of tools, materials, and procedures ☐ 17. Determines how to collect and record data (e.g., use of table, drawing) ☐ 18. Redesigns investigation based on design flaws or designs new investigation using new evidence	☐ 21. Uses tools correctly; collects accurate data; measures precisely ☐ 22. Records and labels *all* relevant data (e.g., observations, measurement units) ☐ 23. Uses appropriate representations and accurately organizes/displays data (scale for graph, labels table) and observations, (e.g., keys, scale, & details in drawings) ☐ 24. Follows & can explain procedures (e.g., multiple trials, control variables) ☐ 25. Interprets *all* data: summarizes results using key ideas; identifies patterns; connects data to prediction (support/refute); shows relationships between variables

D	**Is the student able to use information and/or data to communicate and support ideas and draw conclusions?**	E	**List common assessment tasks, specific in-depth learning experiences (e.g., projects), and/or inquiry investigations used to assess science inquiry.**	***Earth & Space Science Concepts***	***Physical Science Concepts***	***Life Science Concepts***
	Developing & Evaluating Explanations		***List Common Assessments & (codes for) Related Skills***	***Units of Study (& assessment)***	***Units of Study (& assessment)***	***Units of Study (& assessment)***
	1. Nonverbally conveys ideas investigated (drawing, movement, demonstrate with objects)	**	**Trees (source DE Dept of Ed): A1, A3, A4, C1, C3, C5, D1, D4, D5, D6**	**Objects in the Sky:** Observing living and nonliving things in the sky; describe movements and locations (e.g., birds, planes, clouds)	**What is Sound?** Make musical instruments to explore pitch, vibration, etc.	**Plants:** Basic needs, structures & functions; living and nonliving *(Trees)* **Senses:** using 5 senses to observe
	2. Verbally conveys ideas investigated					
	3. Uses some letters or words to label drawings					
	4. Organizes data (e.g., makes pictograph, colors in bar graph, fills in chart, sorts objects)					
	5. Explains observations using props (e.g., table, drawing, graph, objects)					
	6. Sorts/classifies objects by observable attribute (e.g., color, size, shape, etc.)					
	7. Writes a coherent message (1-2 sentences) to describe observations (I saw…; I found out…)	**	**How is a Cactus Like a Hotel (source:** *Best of* ***Science Exemplars K-5*****): A6, A7, C9, C10, D7, D8, D9**	**Weather & People:** Measuring changes; day/night, seasons; patterns	**Sink & Float:**	**Living Things:** Structure & Function; habitats; food webs *(How is a Cactus…)*
	8. Organizes data (e.g., pictograph, diagram, bar graph, chart)					
	9. Sorts/classifies objects and explains groupings					
	10. Describes results (in table, diagram, drawing)					
	11. Describes or writes about a sequence of observed events using some details/evidence			**Objects in the Sky:** Observing things in the sky; describe movements and locations (e.g., sun, stars, clouds)	**Solids, Liquids, & Gases:**	**Life Cycles:** Plants and animals
	12. Organizes data (e.g., pictograph, diagram, bar graph, chart, model) and identifies patterns					
	13. Sorts/classifies objects and materials and justifies groupings (e.g., with evidence, definitions)					
	14. Uses main points, details, and evidence to summarize results & conclusions				**Forces & Motion**	**Human Body**
	15. Uses labeled drawings and data tables to support interpretations (e.g., patterns, trends)					
	16. Discusses possible errors in data					
	17. Relates data to prediction/question					
	18. Proposes new questions based on results					
	19. Identifies data relevant to task/question	**	**Go With the Flow (source CT Dept of Ed): A17, A18, B13, B14, B17, C21, C22, C23, D19, D20, D22**	**Water & Earth Materials** Test and compare soils; erosion; forces that affect earth *(Comparing Soils)*	**Electricity:** Properties of electric circuits; investigate static electricity *(Go with the Flow)* **Energy: Heat & Light**	**Structures of Life** (FOSS) Seed germination, graphing, life cycles
	20. Classifies data into meaningful categories					
	21. Compares own data to other sources (e.g., scientific data given, science concepts, proposed predictions, seemly inaccurate results)					
	22. Interprets/analyzes data: Uses evidence to explain interpretations of data trends, justify conclusions, evaluate significance of data					
	23. Connects task/model to real world example					
	24. Identifies possible experimental error (e.g., data collection method, insufficient /wrong data)					
	25. Proposes new questions, new predictions, or modified procedures based on results					

References

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Sample K-4 Science Performance Assessments used in the Profile on pages (that assess many of the inquiry constructs in the inquiry profile *within the context of a science domain*)			
Grade	**Name of Assessment**	**Science Domain**	**Sources for Sample Science Assessments**
PreK-K	**Trees**	Life Science	(DE Department of Ed) http://www.scienceassessment.org/
1	**How is a Cactus Like a Hotel ?**	Life Science	***Best of Science Exemplars K-5*** http://www.exemplars.com
4	**Go With the Flow**	Physical Science	(CT Department of Ed) http://www.sde.ct.gov/sde/cwp/view.asp?a=2618&q=320890

Internet Resources

Best of Science Exemplars K-5. (2007). Underhill, VT: http://www.exemplars.com

Connecticut Department of Education. (retrieved 2007). "Curriculum-Embedded Performance Tasks." http://www.sde.ct.gov/sde/cwp/view.asp?a=2618&q=320890

Delaware Department of Education. (retrieved 2007). "Science Assessment Tools for Teachers." http://www.scienceassessment.org/

Hess, K. (2008a). "Analysis to Action: Tools for Using Learning Progressions." [online] available: http://www.nciea.org/publications/Analysis%20to%20Action_KH08.pdf

Hess, K. (2008b). "Developing and Using Learning Progressions as a Schema for Measuring Progress." [online] available: http://www.nciea.org/publications/CCSSO2_KH08.pdf

Rhode Island Department of Education (2008) "NECAP Science Assessment: Guidelines for the Development of Science Inquiry Tasks." NH, RI, and VT Departments of Education. http://www.ride.ri.gov/Assessment/DOCS/NECAP/Science/GDIT_Final_2-15-08.pdf

State of Victoria, Department of Education and Early Childhood Development. Victoria, Australia:

Mathematics Learning Progression: http://www.education.vic.gov.au/studentlearning/teachingresources/maths/mathscontinuum/default.htm

Reading Learning Progression: http://www.education.vic.gov.au/studentlearning/teachingresources/english/englishcontinuum/reading/default.htm

Science Learning Progression: http://www.education.vic.gov.au/studentlearning/teachingresources/science/scicontinuum/research.htm

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