Title – 4th Grade Science Student Learning Objective

Content Area – Science

Grade Level – 4th

Students – 30

Interval of Instruction – Year

Main Criteria	Element	Description
Essential Question: What are the most important knowledge/skill(s) I want my students to attain by the end of the interval of instruction?		
Priority of Content	**Objective Statement**	Students will be able to ask questions relating to patterns in the natural world (including weather observations, weather changes and patterns, changes of phase of common materials, sorting and classifying plants and animals by their characteristics, and distinguishing between inherited and learned traits), construct explanations, design and carry out investigations, and obtain, interpret, and communicate data.
	Rationale	We have observed that students in our district have struggled with the practices necessary to make connections between the patterns and the variations that exist in all scientific disciplines. This observation is supported by our Grade 4 Science NECAP Assessment data collected over the past four NECAP administrations (2008-2011), which show a gap in proficiency between multiple choice items and constructed response and inquiry task items. Constructed response and inquiry task items require students to engage in scientific practices in order to demonstrate understanding of scientific concepts and content, particularly assessment targets relating to patterns, which are central to the grade 4 curriculum
	Aligned Standards	**Practices for K-12 Science Classrooms:** 1. Asking questions (for science) and defining problems (for engineering) 2. Developing and using models 3. Planning and carrying out investigations 4. Analyzing and interpreting data 5. Using mathematics, information and computer technology, and computational thinking 6. Constructing explanations (for science) and designing solutions (for engineering) 7. Engaging in argument from evidence 8. Obtaining, evaluating, and communicating information **Crosscutting Concepts:** *Patterns*: Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them. **LS4 (3-4) –9: Students demonstrate an understanding of human heredity by …** **9a** identifying similarities that are inherited from a biological parent. **9b** identifying that some behaviors are learned and some behaviors are instinctive. **ESS1 (3-4) –5: Students demonstrate an understanding of processes and change over time within earth systems by …** **5a** observing, recording, comparing, and analyzing weather data to describe weather changes or weather patterns. **5b** describing water as it changes into vapor in the air and reappears as a liquid when it's cooled. **5c** explaining how this cycle of water relates to weather and the formation of clouds. **PS1 (3-4) –2: Students demonstrate an understanding of states of matter by …** **2a** describing properties of solids, liquids, and gases. **2b** identifying and comparing solids, liquids, and gases.

		2c making logical predictions about the changes in the state of matter when adding or taking away heat (e.g., ice melting, water boiling or freezing, condensation/evaporation).
Essential Question: Where are my students now (at the beginning of instruction) with respect to the objective?		
	Baseline Data / Information	Targets for student performance on the inquiry task are informed by an inquiry practices assignment that was administered as a baseline during the second week of school. The assignment requires students to make observations, formulate a hypothesis, test their hypothesis, and draw a conclusion. The assignment was scored with a district-created rubric on which students can earn up to 15 points. Using this data, I created three groups of students: Group I: 12 students who scored between 0-5 points Group II: 14 students scored between 6-10 points Group III: 4 students scored between 11-15 points
Essential Question: Based on what I know about my students, where do I expect them to be by the end of the interval of instruction and how will they demonstrate their knowledge/skills?		
Rigor of Target	**Target(s)**	1) All students (30/30) will pass (a score of 70% or higher) 6 out of 7 unit tests. Of those, half of the students (15/30) will earn a score of 85% or higher on 6 out of 7 unit tests. 2) Students in Group I will have an average score of 5+ across the 7 inquiry assignments. Students in Group II will have an average score of 10+ across the 7 inquiry assignments. Students in Group III will have an average score of 13+ across the 7 inquiry assignments.
	Rationale for Target(s)	1. The targets for the unit tests are based on past performance of similar groups of students on these same assessments. In reviewing scores from last year's 4th graders, I saw that all students passed 6 out of 7 unit tests with a score of 65% or better. In addition, approximately half passed 6 out of 7 unit tests with a score of 80% or better. This year, I have raised the bar for passing to 70%, and raised the higher tier to 85% because I believe that the changes we've made to our curriculum and my science instruction will enable me to move students even further than in past years. 2. The targets for the inquiry practices assignments are based on the three tiers established by the baseline assessment. These targets require all students to move up on the rubric, but they are tiered to reflect students' differing baselines.

Quality of Evidence	**Evidence Source(s)**	1) Unit Tests: Students will complete a written test at the end of each unit that is comprised of multiple choice, fill-in-the-blank, matching, short answer, and constructed response items. Unit tests were developed along with the District Science Curriculum, by a team of elementary Science educators and approved by the District Curriculum Director. There are 7 Units of Study throughout the school year: i. The Water Cycle ii. Weather Patterns iii. Earth Materials iv. Changes to the Earth's Surface v. Characteristics of Plants vi. Characteristics of Animals vii. Balance in Ecosystems Unit tests will be administered by the classroom teacher at the conclusion of each unit, and the three 4th grade teachers will share grading responsibilities for all grade 4 unit tests. We will score them using the scoring guide and rubric developed by the District Science Curriculum team. 2) Inquiry Practices Assignments: At the conclusion of each unit, students will complete an inquiry practices assignment. Inquiry practices assignments were developed by the District Science Curriculum team, in consultation with the District Curriculum Director. They focus on inquiry practices relating to patters and cause and effect. They are scored with a rubric informed by past NECAP Inquiry Task rubrics. Inquiry practices assignments will be administered by the classroom teacher at the conclusion of each unit, and the three 4th grade teachers will share grading responsibilities for all grade 4 inquiry practices assignments. We will score them using the Inquiry Practices Assignment rubrics created by the district.