Curriculum Sample Template
Max. 8 Pages

Grade Level	Fourth Grade	**Content Area**	Science
Course Title (grades 9-12 Only)	n/a		
Length of Unit	4 days (assessment on Day 5)	**Time of Year**	April
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	By April, Vista College Prep fourth graders students should be familiar with science experiments, taking and recording notes in their science journal, understand temperature, use measuring tools, and be familiar with the term surface area (students will not be assessed on the definition, but will be able to recognize the different objects provided have different surface areas and will be able to connect that as a factor that influences evaporation).		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	Vista College Prep's science program is designed to meet all ADE 2010 Standards (CCSA) through the selection of the FOSS curriculum, a focus on experiments when applicable, and the provision of a rigorous science background to be prepared for advanced middle and high school courses. The science block is aligned to our commitment to small group work and often more kinesthetic learning.		
Standard Number and Description *List the Number* and full description for the required Standard.*	**4.1.3.1:** Analyze data obtained in a scientific investigation to identify trends.		
Summative Assessment *Describe a cumulative and comprehensive activity, clearly separate from instruction and guided or independent practice, which allows each student to individually demonstrate mastery of the required Standard. A copy of the summative assessment must be attached to the curriculum sample.*	Students will be asked to identify trends observed over the course of the week through written response to 6 questions. Each of the questions will require students to analyze data that was obtained in a scientific investigation and identify trends.		
Scoring Scale and Mastery Level *Explain how the assessment is scored, to include points per question, how points are awarded, total points possible, criteria necessary to demonstrate mastery, and grading scale. A copy of the answer key and scoring rubric (whichever applicable) must be attached to the curriculum sample.*	Students will receive two points for correctly answering problems 1-2, and one point for correctly answering problems 3-6. In total there are eight possible points. Students need to earn a 7/8 to master this standard.		
Materials/Resources Needed	Word wall vocabulary, two lamps with exposed light bulb, measuring glasses, variety of bowls with different surface area, science journals, plastic wrap		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

Lesson (add as needed)	Instruction	Student Activities
1	**Objective: Students will be able to create a hypothesis about the impact of temperature on water.** **Objective: Students will be able to monitor the evaporation of water over the course of three days and analyze data collected.** Teacher reminds students of the definition of a hypothesis. Today students will make a hypothesis about the temperature and water. First teacher gives some silly/funny examples of experiments that are easy to do as a class (i.e. number of times teacher will roll a 7 with a die, etc.) to have students practice with making a hypothesis. Teacher has students work with a partner to play the same game and have each partner taking turns to create a hypothesis (teacher has prompts written on board). Teacher has students take out science journals to make a hypothesis about the impact of heat on water and the impact that surface area has on evaporation, and explains they will study heat the next day. Teacher explains that today they are going to learn how to keep track of data and evaluate the data each day. Teacher reminds students that they have been working with ounces. Teacher fills two identical plastic cups with the same amount of water. Each cup is clear and is filled up to 6 ounces. Teacher places plastic wrap over one of the cups. Teacher asks students to write down a hypothesis for this experiment and elicits students in a conversation around "what they think is going to happen" and how they are going to measure the data as the day progresses. Teacher asks students to create a data tracker in their science journal that allows them to monitor the amount of water in the cup over three days. Teacher models how s/he would create the tracker and then has students do the same. Students should have a picture of the cups and note that on Day 1 there are 6 oz. of water in both of the cups. At the end of the day they note how much time has passed and if there is	Students are reminded of the definition of a hypothesis. Students respond as teacher lists examples. Students turn and talk and play the game with a partner. Students take out journals and create a hypothesis. Students listen and observe as the teacher prepares the experiments. Students also create a hypothesis about the water glasses and record it in their journal. Students create a chart that will help them keep track of the data that they are going to collect and observe. Students have a conversation with teacher about their hypotheses. Students watch as the teacher creates a tracker, students provide ideas as the teacher asks questions, and then students can work independently to create and finish their own tracker. Students add a time to their tracker which is two hours since they started

	any change in the water.	the experiment. Students note if there was a change in water (write it in oz.) and how much time has passed.
2	**Objective: Students will be able to track and evaluate data on the impact of temperature on evaporation.** Teacher starts the class period asking students different scenario questions based on the observations they had made the day before about evaporation (starting to ask questions similar to what will be on the assessment and pushing deeper critical thinking). Students start the science period out by checking on the cups (experiment #1), marking day 2, drawing a picture, writing how much time as passed and noting the amount of water left in each cup. Teacher asks students to identify why they think there is a change in the water in each cups and they have a discussion about properties of evaporation. Teacher has students look at their predictions for what will happen when water interacts with hot temperatures (experiment #2). Teacher engages class in a discussion. The teacher divides the class into three groups to help set-up the experiment. Teacher has two lamps and will have an exposed bulb with 15 watts be pointed directly over a clear measuring cup of 8 oz. of water. The other lamp has a 100 watt light bulb pointed directly over a second measuring cup of 8 oz. There is a third 8 oz. measuring cup that is put in a cool part of the classroom. Teacher explains they will leave the light bulb on for two days and observe what happens. Teacher asks students to make a new hypothesis. Teacher asks students to create a new tracker to monitor experiment #2. At the end of the day they note how much time has passed and if there is any change in the water for both experiment #1 and #2.	Students go up to the water, observe and mark the levels in their tracker. Students will note that the water level is going down in the uncovered cup. Students engage with the teacher in discussion. Students engage in a discussion with the teacher. Students divide into three groups – one group sets up the experiments with the 15 watt bulb, the other with the 100 watt bulb, and the other by itself in cool part of the room. Students now make a new hypothesis on what the difference in temperatures will mean for the water. Students create a new tracker in their journal to monitor what time the experiment started and how many ounces we started with, and the different temperatures. Students rotate between the three “centers.” Students also create a pictorial representation of the experiment.
3	**Objective: Students will be able to discover how the amount of water impacts evaporation.** Teacher starts the class period asking students different scenario questions based on the observations they had made the day before about evaporation (starting to ask questions similar to what will be on the	

	assessment and pushing deeper critical thinking). Students start the science period out by checking on the cups in experiment # 1, marking day 3, drawing a picture, writing how much time as passed and noting the amount of water left in each cup. Teacher asks students to identify why they think there is a change in the water in each cups and they have a discussion about properties of evaporation. **Teacher makes observation in accordance with students that evaporation occurs when water is exposed to air.** Students start the science period out by checking on the cups in experiment # 2, marking day 2, drawing a picture, writing how much time as passed and noting the amount of water left in each cup. Teacher asks students to identify why they think there is a change in the water in each cups and they have a discussion about properties of evaporation. **Teacher makes observation in accordance with students that heat impacts evaporation, as the water that is under the higher heat, has fewer ounces**. Back to experiment #3, Teacher has students look at their predictions for what will happen when the surface area changes, but there is the same amount of water, and same temperature. Teacher engages class in a discussion. Teacher reviews the definition of surface area. The teacher divides the class into three groups to help set-up the experiment. Teacher has a cake pan filled with 8 oz., a drinking glass filled with 8 oz., and a water bottle (with small opening) filled with 8 oz. Teacher asks students to make a new hypothesis. Teacher asks students to create a new tracker to monitor experiment #3. At the end of the day (during Prep Time for students) they note how much time has passed and if there is any change in the water for both experiment #1, #2 and #3. Each tracker should list data (time passed, water left and a pictorial representation). At the end of each day there should be commentary from the students based on their initial observations at the start of each period and the new round of hypothesis once they see the experiment in action.	Students go up to experiments #1 and #2 and observe and mark the levels in their tracker. Students will note that the water level is going down in the uncovered cup and that higher heat is causing the evaporation to move faster. Students engage with the teacher in discussion and makes observation about trends that they are observing. Students engage in a discussion with the teacher. Students divide into three groups – each group pours the same amount of water into the three items. Students now make a new hypothesis on what the difference in surface area will mean for evaporation. Students create a new tracker in their journal to monitor what time the experiment started and how many ounces we started with, and the different surface areas of each object. Students rotate between the three "centers." Students also create a pictorial representation of the experiment.
4	**Objective: Students will analyze data from experiments and publish trends.**	

	Teacher instructs students to go through three more rotations of observing and taking data for each of the experiments. Students come back together as a group and teacher models how s/he begins to make conclusions about the data. Teacher has students turn and talk with a partner to come up with conclusions and then they share with the class. Students and teachers analyze data, make conclusions about each experiment and identify the trends they noticed after collecting their data: 1) evaporation occurs when water meets air (teacher will not assess this standard as this experiment was introduced as a method of gradual release where students received more support on the first day of this unit to guide students as they learned how to create data trackers) 2) heat makes the evaporation process go faster and 3) the larger the surface area the faster water evaporates. Teacher passes out three clean pieces of paper and instructs students to publish their work on each page (recopying to make sure there are no spelling errors) and including their original hypothesis (made right before each experiment, not from day one) and final conclusion of the trends that they observed.	Students complete one more investigation of gathering data. Students and teacher interpret data (teacher has recorded some on the board) and they create their conclusion for each of the experiments (students first turn and talk with a partner and then share with the class). Students publish their data; record their original hypothesis and their final conclusion about trends they observed.
5	**Assessment: Students will identify trends observed over the course of the week through written response to an assessment.** Teacher passes out assessment. If students finish early they can finish working on adding detail to their published data.	Students complete the assessment and can work on their published analysis of data and trends.

Paste Summative Assessment Here:

Name: _____ Date: _____

Answer the following questions using complete sentences:

1. This chart shows our data collected from experiment #2 with the heat. Evaluate the data by writing a conclusion you can make from reading the data and identify what trends do you notice in this chart?

Cup with the 15 watt light bulb

	Day One	**End of Day One**	**Day two** [1]
How many ounces?	8 ounces	7.8 ounces	7.4 ounces
How much time has passed	0	3 hours	24 hours

Cup with the 100 watt light bulb

	Day One	**End of Day One**	**Day two**
How many ounces?	8 ounces	7.6 ounces	6.8 ounces
How much time has passed	0	3 hours	24 hours

2. This chart shows our data collected from experiment #3 with surface area. Evaluate the data by writing a conclusion you can make from reading the data and identify what trends do you notice in this chart?

Cake Pan

	Day One	**End of Day One**	**Day two** [2]
How many ounces?	8 ounces	7.7 ounces	6.7 ounces
How much time has passed	0	3 hours	24 hours

Drinking Glass

	Day One	**End of Day One**	**Day two**
How many ounces?	8 ounces	7.9 ounces	7.5 ounces
How much time has passed	0	3 hours	24 hours

[1] These are just estimates; the numbers would be reflective of the actual experiment.
[2] These are just estimates; the numbers would be reflective of the actual experiment.

Water Bottle

	Day One	**End of Day One**	**Day two**
How many ounces?	8 ounces	7.9 ounces	7.6 ounces
How much time has passed	0	3 hours	24 hours

3. Using the data you have gathered this week, how does heat impact evaporation?

4. Using the data you have gathered this week, how does surface area impact evaporation?

5. If I made the water temperature hotter, would the number of ounces increase, decrease or stay the same?

6. If the temperature stays the same, but I increased the surface area, would evaporation occur faster or slower?

Paste Answer Key/Scoring Rubric Here:

1. By evaluating this data I can conclude that having a higher wattage (which is more heat) causes the evaporation of water to increase. Therefore, the trend I can identify is that heat is a factor in increasing the speed of evaporation.
2. By evaluating this data I can conclude that having a larger surface area causes the evaporation of water to increase. Therefore, the trend I can identify is that surface areas is a factor in increasing the speed of evaporation.
3. Heat increases the speed of the evaporation process.
4. Larger surface area increases the speed of the evaporation process
5. The number of ounces would decrease.
6. Evaporation would occur faster.

Students will receive two points for correctly answering problems 1-2, and one point for correctly answering problems 3-6. In total there are eight possible points. Students need to earn a 7/8 to master this standard.

_____/8