Curriculum Sample Template

Grade Level	4th grade	**Content Area**	Science
Course Title (grades 9-12 Only)	N/A		
Length of Unit	4 days + 1 day for the summative assessment	**Time of Year**	4th quarter
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Students will be able to read grade level text fluently. Students will be able to speak and write in full sentences to convey ideas. Students will be knowledgeable of various types of graphs, including bar graphs, line graphs, and pictographs. Students will have mastered the skill of entering data into these types of graphs. Students will understand and practice the appropriate norms of group discussion.		
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.*	This unit aligns to the Core Knowledge Sequence, as it uses Core Knowledge content to support students in mastering the State Standard. Content from the domain of "The Water Cycle" will be used in this unit, as well as content from domains previously taught. As described in the Program of Instruction, Cooperative Learning will take place throughout this unit. Each lesson includes a combination of teacher-led instruction, small group interaction, independent practice, and ongoing assessment. Prior to beginning instruction, the teacher will administer an aligned pre-test to assess student understanding, and use data from this to target individual students' needs throughout the unit. Students will individually graph their results on both the pre- and post-tests, and graph their results in an individual portfolio, which serves as a visual representation of progress towards their goals.		
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.*	At the end of this unit, students will be given a two part summative assessment. In Part I, students will analyze two different graphs and answer four questions based on their analysis. In Part II, students will create a graph, using data that they've collected in the first four days of this unit. Then, students will answer two open-ended questions, requiring them to analyze the data from this experiment and identify trends. Please see the assessment attached.		
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*	Each question in Part I will be worth two points. Each question in Part II will be worth four points. Thus, a total of sixteen points is possible. Scores will be calculated using the attached answer key/rubric. Grading will be based on the following scale: 0-9 points= Falls Far Below; 10-12 points = Approaches; 13-14 points = Meets; 15-16 points = Exceeds. According to the program of instruction, a score of 80% indicates Mastery. Thus, a score of 13 or more points on this assessment will indicate student Mastery of this standard.		

applicable) must be attached to the curriculum sample.	
Materials/Resources Needed	Document camera; recording sheets, water glass, and water for homework assignment; graph paper; chart paper; student Science Journals

Lesson (add as needed)	**Instruction** TW= Teacher will; SW = Student will; TPS= Think, Pair, Share; INM = Introduction to new material; CFU = Check for understanding; GP= Guided practice; IP = Independent practice	**Student Activities**
1	**Activation of Prior Knowledge:** TW ask students to share what they already know about different types of graphs.	SW share what they already know about graphs.
	Objective: SW collect, graph, and analyze data in a pictograph.	SW repeat and discuss today's objective.
	INM: Key Points: 1. Data is factual information, in the form of measurements and statistics. 2. Graphs give us information about the items being measured. 3. We can analyze, or read and think about graphs, to identify this information. 4. A pictograph gives information through pictures 5. A "trend" is a pattern, or something that you can predict: it can be positive or negative	SW actively listen to today's key points, and take notes in their Science Journals.
	Modeling: TW model collecting data and entering it into a pictograph. TW ask students which has been their favorite Core Knowledge domain thus far this year: The Human Body, Chemistry, Electricity, or Geology. TW graph responses uses pictorial representations of each domain. Then, TW model how to answer questions, by analyzing trends in the data (ie: Which domain was the most and least favorite? Do students prefer Life Sciences or Physical Sciences? Etc.)	SW actively engage as the teacher collects data by surveying the class. SW watch as the teacher creates the pictograph, then thinks aloud to answer analytical questions and identify trends.
	Guided Practice: TW give each student a blank template of a pictograph. TW direct students to collect data on their classmates' favorite plant: cactus, sunflower, rose, or daisy. When all data is collected and graphed, TW project questions on the document camera, and SW work in pairs to answer them (ie: Which flower did the most/least students like? Were there any ties? How can you tell? Etc.)	SW conduct an experiment, surveying their classmates' favorite plant. Then, SW enter their data into a pictograph. The, SW work in pairs to analyze the data and answer the teacher's questions.
	Independent Practice: TW give students a word problem, describing the amount of rainfall that occurred in the US last year. SW read the	SW read the problem, create a pictograph describing it, and answer questions by analyzing the graph.

	problem, create a pictograph describing it, and answer questions by analyzing the graph. **Assessment:** TW use today's IP as an assessment of student learning. TW remediate with any student who did not show mastery of the objective. **Closure:** TW direct students to review the notes in their Science Journal, and summarize what they've learned with a partner. TW explain this week's homework assignment: the "Condensation Experiment." Students must fill a glass with water, and let it sit out on a table. TW explain that students will collect data on the amount of water in the glass each evening. TW provide the data collection templates.	SW TPS to summarize what they've learned in Science today. For homework, SW fill a glass with water, measure how many mL are in the glass, and record this data. They will leave the water out on a table, and measure it throughout the week.
2	**Activation of Prior Knowledge:** SW review their Science Journal, and share what they learned yesterday. **Objective:** SW collect, graph, and analyze data in a line graph. **INM:** Key Points: 1. Data is factual information, in the form of measurements and statistics. 2. Graphs give us information about the items being measured. 3. We can analyze, or read and think about graphs, to identify this information. 4. A "trend" is a pattern, or something that you can predict: it can be positive or negative. 5. A line graph gives information through points on a graph connected by a line. **Modeling:** TW model collecting data and entering it into plotted points on the X and Y axis. TW show the class averages on all science quizzes this year. Then, TW model how to answer questions, by analyzing trends in the data (ie: Which month were the highest/lowest scores attained? Did scores go up or down in March? Etc.) **Guided Practice:** TW give each student a blank sheet of graph paper. TW display a chart, showing a fictitious class's quiz scores over the course of a year. TW direct students to work in pairs to graph the scores. When all data is collected and graphed, TW project questions on the document camera, and SW work in pairs to answer them (ie: Which month showed the highest scores? Based on this data, what's your prediction for the next quiz? Etc.) **Independent Practice:** TW show yesterday's word problem, describing	SW review their Science Journal, and share what they learned yesterday. SW repeat and discuss today's objective. SW actively listen to today's key points, and take notes in their Science Journals. SW actively engage as the teacher collects data by reviewing anonymous test scores. SW watch as the teacher creates the line graph. SW listen as the teacher thinks aloud to answer analytical questions and identify trends. SW work in pairs to review the data projected on the board. SW create a line graph using this data. Then, SW work in pairs to answer the teacher's questions about trends in the data. SW share their answers, and discuss one another's ideas. SW re-read the word problem from yesterday. SW create a line graph

	the amount of rainfall that occurred in the US last year. SW read the problem, create a line graph describing it, and answer questions by analyzing the graph. (ie: Which month showed the least amount of rain fall? Predict how much rainfall will occur next month. Etc.) **Assessment:** TW use today's IP as an assessment of student learning. TW remediate with any student who did not show mastery of the objective. **Closure:** TW direct students to review their Science Journal, and summarize what they've learned with a neighbor. TW remind students to collect data on the amount of water in the glass.	using the data. The, SW answer questions on a separate sheet of paper (ie: Which month showed the least amount of rain fall? Predict how much rainfall will occur next month. Etc.) SW share what they've learned today with a partner. As homework, SW measure and record the amount of water in their glass at home.
3	**Activation of Prior Knowledge:** SW review their Science Journal, and share what they learned yesterday. **Objective:** SW collect, graph, and analyze data in a bar graph. **INM:** Key Points: 1. Data is factual information, in the form of measurements and statistics. 2. Graphs give us information about the items being measured. 3. We can analyze, or read and think about graphs, to identify this information. 4. A "trend" is a pattern, or something that you can predict: it can be positive or negative. 5. A bar graph gives information through vertical or horizontal bars. **Modeling:** TW model collecting data and entering it into a bar graph. TW show and graph the class averages on all science quizzes this year. Then, TW model how to answer questions, by analyzing trends in the data (ie: Which month were the highest/lowest scores attained? Did scores go up or down in March? Does this show the same trends as the line graph from yesterday? Why or why not? Etc.) **Guided Practice:** TW give each student a blank sheet of graph paper. TW give directions for today's experiment: to survey the class and record one another's favorite type of cloud: cirrus, stratus, cumulus. TW direct students to work in pairs to graph the results. When all data is collected and graphed, TW project questions on the document camera, and SW work in pairs to answer them (ie: Which cloud type is most/least preferred? If we added 5 more students to our class, what might the results be? Etc.)	SW TPS what they learned about line graphs and trends yesterday. SW repeat and discuss today's objective. SW actively listen to today's key points, and take notes in their Science Journals. SW actively engage as the teacher collects data by reviewing the class average on all Science quizzes this year. SW watch as the teacher creates the bar graph. SW listen as the teacher thinks aloud to answer analytical questions and identify trends. SW conduct an experiment by surveying their classmates' favorite ice cream flavors. SW work in pairs to enter the results into a bar graph. Then, SW work with their partner to analyze the data and answer the teacher's questions about trends they can see. SW read the problem, create a bar graph describing it, and answer

	Independent Practice: TW show yesterday's word problem, describing the amount of rainfall that occurred in the US last year. TW direct students to create a bar graph and answer the questions individually. **Assessment:** TW use today's IP as an assessment of student learning. TW remediate with any student who did not show mastery of the objective. **Closure:** TW direct students to review their Science Journal, and summarize what they've learned with a neighbor. TW remind students to continue their Condensation Experiment at home, and collect data on the amount of water in the glass.	questions by analyzing the graph. (ie: Which month showed the least amount of rain fall? Predict how much rainfall will occur next month. Etc.) SW share what they've learned today with a partner. As homework, SW measure and record the amount of water in their glass at home.
4	**Activation of Prior Knowledge:** SW review their Science Journal, and share what they learned yesterday. **Objective:** SW analyze data collected in an experiment to identify trends and answer questions. **INM:** Key Points: 1. Data is factual information, in the form of measurements and statistics. 2. Graphs give us information about the items being measured. 3. We can analyze, or read and think about graphs, to identify this information. 4. A "trend" is a pattern, or something that allows you to make a prediction: it can be positive or negative. **Modeling:** TW show class the data that she's been collecting in her own Condensation Experiment, measuring the amount of water in her glass over this week. TW model putting this data into a bar graph. TW use the "Think Aloud" strategy to analyze the graph, highlight the trend, and answer questions using the data. **Guided Practice:** TW use one volunteer's data from the Condensation Experiment, and project on the board. TW lead the class in using the data to create a graph. Then, TW direct students to work in groups of two to answer questions using the data. (ie: What trend do you see? Make a prediction of what the next day's measurement will be? What caused this trend? Does the amount they began with effect the amount they ended with? Etc.) **Independent Practice:** TW project another student's Condensation Experiment data. TW direct students to individually graph this data, into	SW TPS what they learned about line graphs and trends yesterday. SW repeat and discuss today's objective. SW actively listen to today's key points, and take notes in their Science Journals. SW actively engage as the teacher reviews the data she has collected with the water in a glass. SW watch as the teacher creates the bar graph showing the amount of water in the glass each day this week. SW listen as the teacher thinks aloud to answer analytical questions and identify trends. SW work with the teacher to review the data and create the bar graph. Then, SW work with a partner to answer questions using the data. (ie: What trend do you see? Make a prediction of what the next day's measurement will be? What caused this trend? Etc.) SW independently review another set of data. SW individually graph this data, and then answer the five questions on a worksheet, analyzing the

	a graph of their choice. TW give each individual student a list of five questions, which they must analyze the data to answer. **Assessment:** TW use today's IP as an assessment of student learning. TW remediate with any student who did not show mastery of the objective.**Closure:** TW direct students to review their Science Journal, and summarize what they've learned with a neighbor. TW remind students to collect data on the amount of water in the glass, one last time.	graph to identify trends and make predictions. SW share what they've learned today with a partner. As homework, SW measure and record the amount of water in their glass at home.

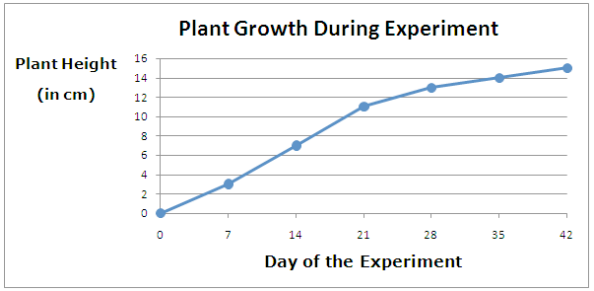
Science Unit Assessment

Name: _____

Arizona State Standard: S1C3PO1: Analyze data obtained in a scientific investigation to identify trends.

Part I: Directions: Analyze the graphs to answer the questions.

Martha measured her plant every 7 days and recorded the growth on the graph below.



1. How many centimeters did the plant grow between the day 7 and day 21? _____

2. Which statement is TRUE?

A. The data doesn't show a trend.
B. The data show a positive trend, with the plant height increasing as time increases.
C. The data show a negative trend, with the plant height increasing as time decreases.
D. None of the above are true.

Ms. Bennett is a nurse. Whenever babies have appointments at the doctor's office where Ms. Bennett works, she weighs the babies. The chart below shows the weights of three babies that Ms. Bennett has weighed several times.

Age (in weeks)	Baby X's Weight	Baby Y's Weight	Baby Z's Weight

0	7 lb.	9 lb.	11 lb.
12	9 lb.	10 lb.	12 lb.
24	12 lb.	12 lb.	13 lb.
48	16 lb.	15 lb.	17 lb.

3. Which of the babies has gained the most weight since birth? _____

4. Ms. Bennett also sees Baby W. Baby W weighed 8 lbs. at birth. How much did Baby W most likely weigh at his 12 week check-up?

A. 8 lbs.
B. 5 lbs.
C. 10 lbs.
D. 17 lbs.

Part II: Directions: Use the data you've collected to create a graph of the amount of water in your glass over the past four days. Once you've created your graph, answer the questions below.

5. What trend do you see in the data? Explain.
_____

6. Make a prediction: if you measured the water in the glass tonight, how much would be in the glass? Why do you predict this?
_____

Answer Key

Item Number	Correct answer	Points
1	8 inches	2
2	B	2
3	Baby X	2
4	C	2
5	Will vary slightly. Acceptable answer will be similar to the following: *I see a negative trend in the data, because as the time increased, the amount of water in the glass decreased.*	4
6	Will vary slightly. Acceptable answer will be similar to the following: *I predict that the water would be at ___ mL tonight, because each day it has evaporated about ___ mL.*	4

Total score: _____/16 0-9 points= Falls Far Below; 10-12 points = Approaches; 13-14 points = Meets; 15-16 points = Exceeds