

## Summary

### Program Name & Overall Goals/Objectives of Program

#### Nye County School District Science Project

Goal: The Instructional Coach assigned to the science project will work with middle school and high school science teachers to align the science curriculums, develop common assessments and monitor student mastery, creating a system that supports teacher/leader retention and student mastery.

#### Objective 1:

Short-term - NCSD's Instructional Coach assigned to the science project, the Director of Curriculum and Instruction and the Science Department Head from PVHS will be trained by Carson City School District's Science Coach on the development of an aligned science curriculum, common assessments and student tracking of learning targets.

Long term – Create a student-centered learning curriculum that provides growth for all students as measured by state and local assessments.

#### Objective 2:

Short-term - By the end of the 2016-2017 school year, all 6<sup>th</sup> – 12<sup>th</sup> grade science courses in NCSD will have a curriculum aligned to the Nevada Academic Content Standards for Science with the following deliverable; 3-week unit learning guides for students that support independent working, critical thinking and lifelong learning.

Long-term – NCSD will align the science curriculums, develop common assessments and monitor student progress, creating a system that supports teacher/leader retention and student mastery.

#### Objective 3:

Short-term - By the end of the 2016-2017 school year, 100% of science teachers in NCSD will be using common assessments supporting teacher efficacy through the PLC process, contributing to teacher retention.

Long-term – 100% of the science teacher in middle and high school will use the PLC process to reach mastery in using data to guide their instruction, increasing student achievement across the district.

#### Objective 4:

Short-term - 100% of science teachers in middle and high school will be using MasteryConnect to guide student mastery of learning targets and will use the immediately accessible data to guide instruction.

Long-term – Working in a collaborative environment, 100% of the science teachers in middle and high school will be proficient in using data to guide their instruction.

### Abstract and Results Overview

#### Abstract

NCSD will align the science curriculums, develop common assessments and monitor student progress, creating a system that supports teacher/leader retention and student mastery. The process will be completed during the 2016-2017 school year using Professional Learning Communities as the catalyst. According to the Annenberg

Institute, “educational researchers have extensively studied professional learning communities and their effects. Not surprisingly, researchers found that having strong professional learning communities in schools led to many positive cultural changes, including reduced teacher isolation, increased peer learning, increased content knowledge, increased knowledge of effective teaching strategies, greater job satisfaction, and higher teacher retention rates”.

Staff from NCSD will receive professional development from the Science Instructional Coach in Carson City School District on the PLC process used to align the science curriculum, develop science common assessments and the use of their student academic tracking system (MasteryConnect). The Instructional Specialist and Director of Curriculum and Instruction will develop a schedule to bring Nye science teachers from throughout the district together to develop 3-week unit learning guides for students that support independent working, critical thinking and lifelong learning targets. Teachers will create common formative assessments to assess knowledge of the student’s level of mastery on each science unit. This knowledge will be used to inform instruction, assisting teachers to deliver early intervention or excelled instruction based on the individualized student needs.

Funding will be used to support all 25 middle and high school science teachers in the district. It will also support 10 site administrators in the improvement of student academic achievement and retaining the high quality teachers that work to develop the curriculum and assessments.

After developing the 3-week science units and common assessments, science teachers will use MasteryConnect to enter learning targets and monitor the progress that each student is making towards their goal. Evaluation of the system will be ongoing with teachers agreeing to make changes when needed. Long term evaluation will come from the NWEA MAP assessments at the middle school level and end of course and ACT exams at the high school level.

## Results Overview

Training for Department Chairs. NCSD’s Director of Curriculum and Instruction and the Science Department Heads from PVHS and RCMS were trained by Carson City School District’s Science Coach on the development of an aligned science curriculum, common assessments and student tracking of learning targets.

Throughout the 2016-17 school year, NCSD science teachers collaborated to align the curriculum with the NACS for Science. Unit Maps have been completed for:

- Science 6
- Science 7
- Science 8
- Biology
- Geoscience
- Chemistry
- Physical Science

In addition, science teachers collaborated to develop Learning Guides for each 3-week unit in the courses listed above. The curriculum documents can be found here: [Google Folder](#)

Professional development classes in MasteryConnect were offered during the 2017-2018 school year. On May 31 we provided specific training with a MasteryConnect trainer for science teachers in creating district curriculum maps in MasteryConnect. These curriculum maps were then pushed out to all science teachers in NCSD. Teachers create their trackers from these district Curriculum Maps. Science teachers used MasteryConnect to create trackers in order to have real time information on a student's progress toward mastery of the standards in a unit.

Professional development and resources for all secondary science teachers. All NCSD Science teachers received resources and equipment to support the professional development they received and facilitate NGSS aligned instruction and assessment.

### Grant Funded Activities (Complete items a. – g. for EACH activity)

*Name of Activity and Overview.* Training for Department Chairs. NCSD's Director of Curriculum and Instruction and the Science Department Heads from PVHS and RCMS were trained by Carson City School District's Science Coach on the development of an aligned science curriculum, common assessments and student tracking of learning targets.

*Participant Information (who, roles, how many, demographics, etc):* Two teachers, the PVHS and RCMS Department Chairs, traveled to Carson City to meet with their science instructional coaches on September 20, 2016. The two Department Chairs also participated in the NVACSS Implementation Guide: Assessment Summit, facilitated by Kris Carroll, SNRPDP, on December 14, 2016.

#### *Area(s) of Effectiveness Measured*

*Improving Student Achievement:* By being trained and following the process that Carson City School District has developed to improve student academic achievement and Tier I instruction, NCSD will see increased student achievement in science, based on state testing.

*Assisting teachers, administrators, and other licensed educational personnel:* The knowledge gained by the Director of Curriculum and Instruction and the teacher/leader will be shared with teachers, administrators and other licensed and non-licensed personnel.

*Changes in instructional or administrative practices:* The NCSD Science Project will use the knowledge gained in Carson City School District and transfer it to local staff, incorporating change in instruction, student outcomes and administrative practices.

*Improving the recruitment, selection, and retention of effective teachers and principals:* The Science Project has developed a systematic student centered learning system that will attract new teachers and retain high quality teachers that assist in developing the system.

*Effectiveness Measure for Each Area, Including Rationale for Chosen Measure:* We used NWEA MAP testing to track growth that middle school students are making in science and end of the course and ACT exams for high school students. There was a slight dip in most science scores across the district which is a normal result for the first year of this work. Teachers will continue to focus on the student data to guide changes to the first development of an aligned curriculum and assessments.

NYE COUNTY SCHOOL DISTRICT SCIENCE PROJECT

School	2015-2016 % Prof	2016-2017 % Prof
Tonopah MS	47.83%	45.00% spring
Rd. Mtn. MS	39.13%	85.71% spring
Rosemary Clarke MS	56.51%	56.06% winter
Beatty MS	62.50%	55.56% spring
Amargosa MS	55.00%	64.71% spring

The NCSD Mean Scale Score on the ACT Science Exam was 17.3 in 2015-16 and 17.3 in 2016-17. Since 2017 was the first year of the science End of Course Exam, we will use those results as a baseline.

*Implications for Future Implementation:* NCSD will continue to develop the capacity of our science teachers/leaders through ongoing support from the Regional Professional Development Program.

*Supporting Materials. Agendas:*

Nye County School District Visit Agenda Tuesday, September 20, 2016 Carson Middle School Room 33		
		
Time	Topic	Facilitator
9:00	Welcome to Carson City School District • Introductions	Amy Robinson
9:05	Overview of the Learner Centered Model (LCM) • What does it mean to be learner centered? • Learner Centered Model Playbook • Key vocabulary	Amy Robinson
9:30	Components of the Learner Centered Process in Relation to Science • Aligning curriculum with the NGSS • Developing units of study • Developing common assessments • Gathering resources • Using <u>MasteryConnect</u> to track mastery and inform instruction	Rod Butler
11:00	Lunch with Dr. Pradere	
12:15	Carson High School Classroom Observation Things to look for: • Current learning target • Learning Guide • Use of assessment (use of <u>MasteryConnect</u> )	Rod Butler
1:00	Carson Middle School Classroom Observation Things to look for: • Current learning target • Daily objective relevant to the learning target • Learning Guide • Use of assessment (use of <u>MasteryConnect</u> )	Amy Robinson
1:30	Debrief Observations and Q & A	Rod and Amy
3:00	Adjourn	

Nevada Academic Content Standards for Science Implementation Guide:  
Assessment Summit

Date: December 14, 2016

Time: 9:00 am - 4:00 pm  
Coffee and tea (provided): 8:00 am - 11:30 am  
Lunch (provided): 11:45 am - 12:30 pm

Location:  
Eldorado Convention Center  
345 North Virginia Street  
Reno, NV 89501

Preparation:  
Please attend with your thoughts, specific questions, and ideas to think strategically about science assessment in Nevada. This agenda is organized around big ideas, couched as driving questions. To prepare for the meeting, please think about how you would address each of the driving questions. You may not be able to address all aspects of each question, based on your stakeholder perspective. However, this is the intent of bringing multiple stakeholders together.

Summit Goal:  
Collaborate, advise, and support the development of strategic NVACSS Implementation Guide assessment goals and identify which stakeholder groups can best support the goals to describe the vision of a statewide comprehensive science assessment system.

Driving Questions:

What are the shifts initiated by the new Nevada Academic Content Standards for Science?

What is the "new" approach to measuring student understanding based on the NVACSS?

What would an ideal assessment system look like from all stakeholder perspectives?

What are the criteria and constraints related to our ideal assessment system goals?

Meeting Registration: <https://goo.gl/forms/U69ceDW0CeHcRv8l1>

*Name of Activity and Overview:* Curriculum development. Throughout the 2016-17 school year, NCSD science teachers collaborated to align the curriculum with the NACS for Science. Unit Maps have been completed for:

- Science 6
- Science 7
- Science 8
- Biology
- Geoscience
- Chemistry
- Physical Science

In addition, science teachers collaborated to develop Learning Guides for each 3-week unit in the courses listed above. The curriculum documents can be found here: [Google Folder](#)

*Participant Information (who, roles, how many, demographics, etc):*

- a. The Science Curriculum Development Team consisted of secondary science teachers representing all of the district middle and high schools. There were 4 middle school science teachers and 7 high school teachers. The district secondary instructional coach and the Director of Student Achievement were also on the Team. The team met on:
  - i. September 26-27, 2016
  - ii. November 17-18, 2016
  - iii. December 12, 2016
  - iv. January 13, 2016
  - v. January 19, 2017
  - vi. February 28, 2017
  - vii. March 31, 2017
  - viii. May 5, 2017
  - ix. May 9, 2017
  - x. May 22-24, 2017 - Summer Workshop - 9 participants
  - xi. May 30, 2017
  - xii. June 1, 2017

### Area(s) of Effectiveness Measured

*Improving Student Achievement.* Having a “guaranteed and viable curriculum” has been shown to have a strong impact on student achievement. By developing a guaranteed, viable district curriculum, NCSD is ensuring that instruction is focused on the NACSS and that student progress toward mastery of specific learning targets is monitored and addressed.

*Assisting teachers, administrators, and other licensed educational personnel:* The 3-week unit Learning Guides support a student centered model and assist teachers in identifying student individualized needs. Each course level teacher now has Learning Guides with specific learning target for each unit of instruction. This guides the

teacher's instruction and enables the teacher to monitor student progress towards mastery of a standard and reteach areas of student weaknesses, using the PLC model for support. Teachers are working together to improve instruction at each school site and across the district.

*Changes in instructional or administrative practices:* The NCS D Science Project has supported the development of a curriculum that is aligned to the Nevada State Content Standards for Science. The Team has begun to develop common formative assessments to support student centered learning and use a student data system that provides information on student learning to teachers and administrators.

*Improving the recruitment, selection, and retention of effective teachers and principals:* The Science Project has supported the PLC process and a student centered learning model that will attract new teachers and retain high quality teachers that assist with the process.

*Effectiveness Measure for Each Area, Including Rationale for Chosen Measure:* We used NWEA MAP testing to track growth that middle school students are making in science.

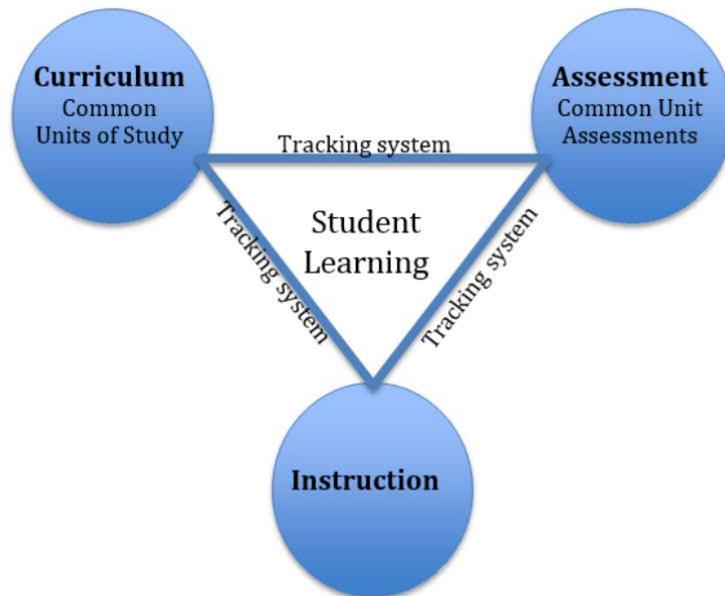
School	2015-2016 % Prof	2016-2017 % Prof
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End of the course and ACT exams will be used for high school students. The NCSD Mean Scale Score on the ACT Science Exam was 17.3 in 2015-16 and 17.3 in 2016-17. Since 2017 was the first year of the science End of Course Exam, we will use End of Course results as a baseline, when the results become available.

**Implications for Future Implementation:** Curriculum documents are “living documents.” As teachers use the science Unit Maps and Learning Guides, student achievement data will inform our decisions about revisions and updates to the documents. Teachers will meet in PLCs to evaluate the effectiveness of the curriculum. The Science Curriculum Development Team will meet in the spring of 2018 to make revisions to the Unit Maps and Learning Guides. Furthermore, teachers have begun to develop and use common assessments across the district to drive instructional practices, and this work will continue through the 2017-2018 school year. The team is making great progress in aligning instruction and assessment with the three dimensions of the science standards. Through workshops with SNRPDP and Argument Driven Inquiry, in addition to professional learning around Professional Learning Communities and data driven decision making, the team members are developing their capacity to create and use effective assessments to drive the instruction. As the assessments are developed, they are being added to the district curriculum maps in Mastery Connect, to facilitate collaboration, tracking of student mastery, and the work of PLCs.

## Supporting Materials

### NCSD Student Centered Model



Sample Unit Map:

NYE COUNTY SCHOOL DISTRICT UNIT MAP

Course Name: Biology

**Course Description (Big Idea):** This course is an introduction into the modern concepts of biological sciences as well as the history and development of biology. Life processes and basic organization of form and function of all kingdom representatives are stressed. This course is considered a laboratory science course for college admissions.

Quarter 1:

Unit 1 (2 weeks)	Unit 2 (3 weeks)	Unit 3 (3 weeks)
<b>Concept: Nature of Biology</b>	<b>Concept: Chemistry of Biology</b>	<b>Concept: Cell Structure &amp; Function</b>
Standards: NGSS HS-PS1-1, HS-PS1-2, HS-PS1-A	Standards: NGSS HS-LS1-6	Standards: NGSS HS-LS1-2
Objectives: Students will be able to... <ul style="list-style-type: none"> <li>conduct a scientific investigation using appropriate terminology and appropriate SI measuring units.</li> <li>distinguish the six characteristics of life.</li> </ul>	Objectives: Students will be able to... <ul style="list-style-type: none"> <li>use the Periodic Table to predict the properties of elements.</li> <li>describe and differentiate between the four macromolecules of life.</li> </ul>	Objectives: Students will be able to... <ul style="list-style-type: none"> <li>model how systems interact to form an organism.</li> <li>explain historical events that lead to modern cell theory.</li> </ul>
Essential Questions: <ul style="list-style-type: none"> <li>How do scientists investigate a problem and report their results?</li> <li>How do I use the scientific method to investigate and solve my problems?</li> <li>What is life?</li> <li>What factors might you examine to classify life into groups?</li> <li>How does technology continually change how scientists work?</li> </ul>	Essential Questions: <ul style="list-style-type: none"> <li>What are the properties of water that make it unique and essential for life?</li> <li>How are atoms and their interactions the basis for life?</li> <li>What bonding properties of carbon allow for the chemistry of life?</li> <li>What are the components of a chemical reaction?</li> </ul>	Essential Questions: <ul style="list-style-type: none"> <li>Who coined the term "cell" for the units of life?</li> <li>What are the three unifying principles of the cell theory?</li> <li>How are eukaryotic cells different from prokaryotic cells?</li> <li>How do materials pass in and out of the cell to maintain homeostasis?</li> <li>Distinguish between different organelles and their functions.</li> </ul>
Evidence of Mastery: <ol style="list-style-type: none"> <li>Pre-assessment Unit 1 <a href="#">Pre Test</a> in MC</li> <li>Common Formative Assessments Microscope Lab in MC</li> <li>Post-assessment Unit 1 Post Test in MC</li> </ol>	Evidence of Mastery: <ol style="list-style-type: none"> <li>Pre-assessment Unit 2 <a href="#">Pre Test</a> in MC</li> <li>Common Formative Assessments pH Lab</li> <li>Post-assessment Unit 2 Post Test in MC</li> </ol>	Evidence of Mastery: <ol style="list-style-type: none"> <li>Pre-assessment Unit 3 <a href="#">Pre Test</a> in MC</li> <li>Common Formative Assessments Animal &amp; Plant Coloring Page</li> <li>Post-assessment Unit 3 Post Test in MC</li> </ol>
Resources and Materials: District Issued Common Textbook Microscope Supplies	Resources and Materials: District Issued Common Textbook Litmus paper, various acid & base solution	Resources and Materials: District Issued Common Textbook Animal & Plant Cell Packet, colored pencils

NYE COUNTY SCHOOL DISTRICT UNIT MAP

**CourseName:** Biology

**Course Description (Big Idea):** This course is an introduction into the modern concepts of biological sciences as well as the history and development of biology. Life processes and basic organization of form and function of all kingdom representatives are stressed. This course is considered a laboratory science course for college admissions.

**Quarter 2:**

Unit 4 (4 weeks)	Unit 5 (4 weeks)
Concept: Cells & Energy	Concept: Cell Cycle & Cell Reproduction
Standards: NGSS HS-LS1-3, HS-LS1-5, HS-LS1-7, HS-LS2-3	Standards: NGSS HS-LS1-4, HS-LS3-1, HS-LS3-2
Objectives: Students will be able to... <ul style="list-style-type: none"> <li>describe how organisms maintain homeostasis.</li> <li>explain how organisms obtain and use the matter and energy to live and grow.</li> </ul>	Objectives: Students will be able to... <ul style="list-style-type: none"> <li>explain how cells grow and divide to reproduce.</li> <li>illustrate the phases of the cell cycle.</li> </ul>
Essential Questions: <ul style="list-style-type: none"> <li>How do animal cells harvest and process energy?</li> <li>How do plant cells harvest and process energy?</li> <li>What energy drives cellular life?</li> <li>Where does this energy come from and go to?</li> <li>How does energy transform from the primary source through the chloroplast and mitochondria?</li> </ul>	Essential Questions: <ul style="list-style-type: none"> <li>How and why do cells reproduce?</li> <li>How are cell division and reproduction related?</li> <li>Distinguish between mitosis and meiosis.</li> </ul>
Evidence of Mastery: <ol style="list-style-type: none"> <li>Pre-assessment Unit 4 Pre Test in MC</li> <li>Common Formative Assessments Diffusion &amp; Osmosis Lab</li> <li>Post-assessment Unit 4 Post Test in MC</li> </ol>	Evidence of Mastery: <ol style="list-style-type: none"> <li>Pre-assessment Unit 5 Pre Test in MC</li> <li>Common Formative Assessments Mitosis Flip Book</li> <li>Post-assessment Unit 5 Post Test in MC</li> </ol>
Resources and Materials: District Issued Common Textbook Ziploc bags, dialysis tubing, eggs, vinegar	Resources and Materials: District Issued Common Textbook Index cards, colored pencils

NYE COUNTY SCHOOL DISTRICT UNIT MAP

**CourseName: Biology**

**Course Description (Big Idea):** This course is an introduction into the modern concepts of biological sciences as well as the history and development of biology. Life processes and basic organization of form and function of all kingdom representatives are stressed. This course is considered a laboratory science course for college admissions.

**Quarter 3:**

Unit 6 (4 weeks)	Unit 7 (4 weeks)
<b>Concept: Genetics</b>	<b>Concept: DNA &amp; Protein Synthesis</b>
<b>Standards: NGSS HS-LS3-3</b>	<b>Standards: NGSS HS-LS1-1</b>
<b>Objectives: Students will be able to...</b> <ul style="list-style-type: none"> <li>● apply the principles of Mendelian genetics to predict the probability of allele frequency.</li> <li>● explain alternative patterns of inheritance outside of Mendelian genetics.</li> </ul>	<b>Objectives: Students will be able to...</b> <ul style="list-style-type: none"> <li>● describe the structure and components of DNA.</li> <li>● illustrate the process of transferring information from DNA to a protein.</li> </ul>
<b>Essential Questions:</b> <ul style="list-style-type: none"> <li>● How is genetic information passed through generations?</li> <li>● Distinguish between genotype and phenotype.</li> <li>● How can you use genetic tools to predict the probability of traits?</li> </ul>	<b>Essential Questions:</b> <ul style="list-style-type: none"> <li>● How does DNA and RNA control the structure and function of the cell?</li> <li>● How is DNA copied in the S phase of the cell cycle?</li> <li>● What is the purpose of DNA?</li> <li>● What is the Central Dogma of life?</li> </ul>
<b>Evidence of Mastery:</b> <ol style="list-style-type: none"> <li>1. Pre-assessment Unit 6 Pre Test in MC</li> <li>2. Common Formative Assessments Punnett Squares Pedigree Chart</li> <li>3. Post-assessment Unit 6 Post Test in MC</li> </ol>	<b>Evidence of Mastery:</b> <ol style="list-style-type: none"> <li>1. Pre-assessment Unit 7 Pretest in MC</li> <li>2. Common Formative Assessments Virtual Extraction DNA Model</li> <li>3. Post-assessment Unit 7 Post Test in MC</li> </ol>
<b>Resources and Materials:</b> District Issued Common Textbook Paper, colored pencils	<b>Resources and Materials:</b> District Issued Common Textbook Computers, internet access, genetics.utah.edu, licorice, toothpicks, colored mini marshmallows, paper

NYE COUNTY SCHOOL DISTRICT UNIT MAP

**CourseName: Biology**

**Course Description (Big Idea):** This course is an introduction into the modern concepts of biological sciences as well as the history and development of biology. Life processes and basic organization of form and function of all kingdom representatives are stressed. This course is considered a laboratory science course for college admissions.

**Quarter 4:**

Unit 8 (4 weeks)	Unit 9 (4 weeks)
<b>Concept: Evolution &amp; Classification</b>	<b>Concept: Ecology</b>
Standards: NGSS HS-LS4-1, HS-LS4-2, HS-LS4-3, HS-LS4-4, HS-LS4-4, HS-LS4-5, HS-LS4-6	Standards: NGSS HS-LS2-1, HS-LS2-2, HS-LS2-4, HS-LS2-5, HS-LS2-6, HS-LS2-7, HS-LS2-8
Objectives: Students will be able to... <ul style="list-style-type: none"> <li>describe the evidence that supports the theory of evolution.</li> <li>describe the components of natural selection.</li> <li>explain the processes that lead to speciation.</li> <li>summarize the Linnaean classification system.</li> </ul>	Objectives: Students will be able to... <ul style="list-style-type: none"> <li>explain population phenomena in terms of data expressed graphically.</li> <li>describe evidence for the role of group behavior on individual species chances for survival.</li> <li>classify biomes and describe their effect on biodiversity.</li> <li>illustrate the cyclic flow of matter and energy through the biosphere.</li> </ul>
Essential Questions: <ul style="list-style-type: none"> <li>What tools can I use to identify an organism?</li> <li>How are genetics and evolution related?</li> <li>What biotic and abiotic factors affect evolution?</li> </ul>	Essential Questions: <ul style="list-style-type: none"> <li>How do organisms interact with their biotic and abiotic environment?</li> <li>How does energy and matter flow through an ecosystem?</li> <li>How do we know if an ecosystem is stable or healthy?</li> <li>How do humans have an impact on the diversity and stability of ecosystems?</li> </ul>
Evidence of Mastery: <ol style="list-style-type: none"> <li>Pre-assessment Unit 8 Pre Test in MC</li> <li>Common Formative Assessments Dichotomous Key Predator/Prey Game</li> <li>Post-assessment Unit 8 Post Test in MC</li> </ol>	Evidence of Mastery: <ol style="list-style-type: none"> <li>Pre-assessment Unit 9 Pre Test in MC</li> <li>Common Formative Assessments Carrying Capacity Lab Biome Mapping</li> <li>Post-assessment Unit 9 Post Test in MC</li> </ol>
Resources and Materials: District Issued Common Textbook Paper, dichotomous keys	Resources and Materials District Issued Common Textbook Computers w/ Excel, graph paper, pencils

Sample Learning Guide:

NYE COUNTY SCHOOL DISTRICT UNIT PLAN

Learning Guide

Course Name: Biology

Unit: 2 – Ecosystems Dynamics and Interactions

Unit Essential Questions

- How are the characteristics of populations influenced by physical and biological factors?
- How is biodiversity used as a measure for the health of an ecosystem?
- How do we engineer solutions to reduce human impact on the environment?
- Are humans the driver of the sixth mass extinction?
- Can a sixth mass extinction be avoided?
- What are the benefits of being social?
- Why do birds of a feather flock together?

Student Learning Objectives: Students will be able to ...

- use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems.
- design, evaluate, and refine a solution for reducing impacts of human activities on the environment.
- Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

**SMART Goal:** 80% of our students will score 60% or higher on the unit 2 post-test.

Daily Learning Targets: (Phrased in student-friendly "I can..." statements)

- I can describe how changes in an ecosystem may affect biodiversity and characteristics (e.g. size, distribution, density, and genetic variation) of populations.
- I can explain how factors affect biodiversity at different scales using mathematical representations (e.g., find the average, determine trends, and use graphical comparisons of multiple sets of data).
- I can explain how human activity may result in conditions that affect the environment and biodiversity.
- I can propose solutions and describe the ways a proposed solution decreases the negative effects of human activities that disrupt ecosystems and threaten the survival of species.\*
- I can describe the criteria (e.g., reduction of impacts and human activities to be mitigated) and constraints (e.g., cost, human needs, and environmental impacts) for the solution.\*
- I can evaluate the cost, safety, and reliability as well as the social, cultural, and environmental impacts of the proposed solution.\*
- I can refine a proposed solution by prioritizing the criteria and making trade offs as necessary to further reduce environmental impact and loss of biodiversity while addressing human needs.\*
- I can establish a cause and effect relationship by comparing the survival rate of individuals of the same species interacting as a group versus living outside of the group.
- I can explain how group behavior can increase the chances for an individual and a species to survive and reproduce.
- I can research and assess additional evidence to evaluate the claim that group behavior increases the chance of survival.

Key Vocabulary:

Biodiversity  
 Ecological Diversity  
 Habitat  
 Niche  
 Population Distribution  
 Population Density  
 Resource Partitioning  
 Species Richness  
 Anthropogenic  
 Climate Change  
 Criteria  
 Constraints  
 Invasive Species  
 Tradeoffs  
 Urbanization  
 Conditioning  
 Group behavior  
 Imprinting  
 Individual behavior  
 Instinct  
 Flocking  
 Habituation  
 Herding  
 Migration

Evidence of Mastery:

1. Pre-assessment  
 Unit 2 Pre Test in MC
2. Common Formative Assessments
3. Post-assessment  
 Unit 2 Post Test in MC

Resources and Materials:

District Issued Common Textbook

Agendas:

Monday, September 26 and Tuesday, September 27, 2016  
7:30 – 3:00

**Science Curriculum Development Team**

Curriculum Development throughout the 2016-2017 School Year

**Each quarter, we will:**

**Goal #1**

1. Review and unpack the State Standards for **two** courses
2. Clarify the standards: essential, important, compact
  - a. Endurance
  - b. Leverage
  - c. Readiness

**Goal #2**

1. Vertically align essential standards, eliminating gaps and redundancies
2. Align the standards with our courses
  - a. Develop Course Overviews
  - b. Course Description
  - c. Essential skills and objectives

**Goal #3**

Develop Unit Maps

- a. Organize courses in 3-week units
- b. Identify Essential Questions
- c. Evidence of mastery
- d. Resources and materials

**Goal #4**

Develop units for the courses.

Using the Unit Map:

1. Create a Learning Guide for Each Unit:
  - a. Unit Essential Questions
  - b. Student Learning Objectives
  - c. SMART Goal for the unit
  - d. Daily Learning Targets
  - e. Key Vocabulary
  - f. Evidence of Mastery: Common Assessments
  - g. Resources and materials

**Science Curriculum Development Team**

Thursday, November 17 and Friday, November 18, 2016 --- 7:00 – 2:30

Goals for Curriculum Development throughout the 2016-2017 School Year:

**Goal #1:**

Review and unpack the State Standards

Clarify the standards: Identify Essential/Priority Standards

Endurance

Leverage

Readiness

**Goal #2:**

Vertically align essential standards, eliminating gaps and redundancies

Align the standards with our courses

Develop Course Overviews

Course Description

Essential skills and objectives

**Goal #3: Develop Unit Maps**

Courses organized in 3-week units

Identify Essential Questions

Evidence of mastery

Resources and materials

**Goal #4: Develop Learning Guides for each unit: Every teacher, every student knows the expectations for the unit**

Unit Essential Questions

Student Learning Objectives

SMART Goal for the unit

Daily Learning Targets

Key Vocabulary

Evidence of Mastery: Common Assessments

Resources and materials

**Goal #5: Create Common Assessments**

Determine student's level of mastery on each unit of study

Used to inform instruction

Early intervention

Extensions or enrichment based on individualized student needs

**Goal #6: Use Mastery Connect**

Plan common assessments

Share resources

Track mastery of standards

## Science Curriculum Development Team

Friday, January 13, 2017 --- 7:00 - 2:30

### Location:

Nye County District Office  
484 S West St  
Pahrump, NV 89048

### What to bring:

- Computer to work on material specific to your courses *(on site)*
- Material from the last meeting
- Your current course outline / pacing guide
- Current textbook (if applicable)

1. Project goals
2. What tools can I use to describe mastery of the Performance Expectations?
  - a. Evidence Statements
  - b. Resources (Probe Books as a model)
  - c. How can you use the evidence statements in your work moving forward?
3. What tools are used to evaluate the alignment of lessons/units to the NVACSS?
  - a. EQuIP and NGSS Lesson Screener
  - b. Resources (Discussion: [NGSSPhenomena.com](http://NGSSPhenomena.com), [nextgenscience.org](http://nextgenscience.org), [nextgenstorylines.org](http://nextgenstorylines.org))
  - c. How can you use this information in your work moving forward?
4. Unit Mapping and Learning Targets

### Potential Ideas for Future Meetings:

- Processes for Bundling PEs
- Using the Unit Maps to plan a unit framework (sequencing the learning targets)
- Establishing anchoring phenomena and student generated questions
- Science and Engineering Practices - A deeper dive to develop student scaffolds
- Integration of Unit driven Crosscutting Concepts
- Evaluating the quality of instructional materials (EQuIP or Screening Tool session)

**Name of Activity and Overview:** Training in use of MasteryConnect and development of Curriculum Maps in MasteryConnect.

*Participant Information (who, roles, how many, demographics, etc):*

Professional development classes in MasteryConnect were offered during the 2017-2018 school year. On May 31 we provided specific training with a MasteryConnect trainer for science teachers in creating district curriculum maps in MasteryConnect. These curriculum maps were then pushed out to all science teachers in NCSD. Teachers create their trackers from these district Curriculum Maps. Science teachers used MasteryConnect to create trackers in order to have real time information on a student's progress toward mastery of the standards in a unit. (An example of a curriculum map and a tracker is below.)

### Area(s) of Effectiveness Measured

*Improving Student Achievement.* Teachers use common assessments across the district to drive instructional practices. As common assessments are developed, they are made available to all science teachers in MasteryConnect. Teachers use MasteryConnect to monitor student progress toward mastery of the standards in three week intervals with instruction adapting to the student outcomes. The data tracking system allows teachers to have real time information on a student's progress towards meeting the learning targets. Teachers use the data to inform their instruction and differentiate to meet the student's needs.

*Assisting teachers, administrators, and other licensed educational personnel:* The 3-week unit Learning Guides that have been developed support the student centered learning model and assist teachers in identifying student individualized needs. Teachers monitor student progress towards mastery of a standard and reteach areas of student weaknesses using the PLC model. Teachers are working together to improve instruction at each school site and across the district. The increased PLC time provided allows teachers to assist each other, depending on instructional strengths and weaknesses. In their PLC teams, teachers analyze outcomes as well as colleagues and determine which practices produce the best student results. PLC teams are using the Curriculum Maps, Learning Guides, and common assessments in MasteryConnect, PLC to improve Tier I instruction. This student focus model, using the PLC framework to support teachers and administrators, will increase student achievement.

*Changes in instructional or administrative practices:* This systematic process creates a student centered learning environment. Teachers have time to meet in PLCs and work as a team in support of student learning. Using MasteryConnect to support the student centered model with the 3-week units of instruction, teachers adjust their instruction appropriately, assisting students to reach their learning goals. The PLC process enables teachers to reflect upon their teaching practices, using common assessments. Teachers are working together as a team, driving student achievement with common assessments to guide their instruction.

*Improving the recruitment, selection, and retention of effective teachers and principals:* Researchers found that having strong professional learning communities in schools led to many positive cultural changes, including reduced teacher isolation, increased peer learning, increased content knowledge, increased knowledge of effective teaching strategies, greater job satisfaction, and higher teacher retention rates. The Science Project has developed a systematic student centered learning system that will attract new teachers and retain effective teachers.

**Effectiveness Measure for Each Area, Including Rationale for Chosen Measure:** We used NWEA MAP testing to track growth that middle school students are making in science.

School	2015-2016 % Prof	2016-2017 % Prof
Tonopah MS	47.83%	
Rd. Mtn. MS	39.13%	
Rosemary Clarke MS	56.51%	
Beatty MS	62.50%	
Amargosa MS	55.00%	

End of the course and ACT exams will be used for high school students. The NCSD Mean Scale Score on the ACT Science Exam was 17.3 in 2015-16 and 17.3 in 2016-17. Since 2017 was the first year of the science End of Course Exam, we will use End of Course results as a baseline, when the results become available.

**Implications for Future Implementation:** During the 2017-18 school year, all science teachers will use the district curriculum map in MasteryConnect to create trackers for their classes. This will enable all teachers to use data to inform their instruction and differentiate to meet student’s needs. This will also facilitate the work of PLCs to increase student achievement. Further, the use of MasteryConnect facilitates a student centered learning environment where students have more control of their learning and teachers support student learning. NCSD will continue to develop the capacity of our science teachers to use MasteryConnect through ongoing support from peers, instructional coaches, internal MasteryConnect trainers, and external MasteryConnect trainers.

## Supporting Materials

### MasteryConnect Curriculum Map

Biology Expand All Collapse All 0

**Unit One: Nature of Science** 0 0

August 8 -August 25

- RST.9-10.1** Cite specific textual evidence to support analysis of scie...
- RST.9-10.2** Determine the central ideas or conclusions of a text; trac...
- RST.9-10.3** Follow precisely a complex multistep procedure when ca...
- RST.9-10.4** Determine the meaning of symbols, key terms, and other...
- RST.9-10.5** Analyze the structure of the relationships among concep...
- RST.9-10.6** Analyze the author's purpose in providing an explanation...
- RST.9-10.7** Translate quantitative or technical information expressed...

### Tracker from Mastery Connect for Geoscience class:

LOGGED IN TO ADMINISTRATION MODE

Trackers Assessments Pins Community

Trackers Curriculum Maps Students Progress Reports Custom Reports

Earth Science: HS

	HS-ESS1-1	HS-ESS1-2	HS-ESS1-3	HS-ESS1-4	HS-ESS1-5	HS-ESS1-6	HS-ESS2-1	Plastics B	Plastics Quiz	HS-ESS2-2
36729					BELOW	MEETS	50% (10/20)	60% (12/20)	BELOW	
31166					MEETS	MEETS	85% (17/20)	90% (18/20)	APPROACHES	
39030					MEETS	MEETS	80% (16/20)	85% (17/20)	APPROACHES	
31035										
31762					MEETS	MEETS	80% (16/20)	70% (14/20)	APPROACHES	
32051					MEETS	APPROACHES	75% (15/20)	55% (11/20)	BELOW	
32161					BELOW	APPROACHES	45% (9/20)	50% (10/20)	BELOW	
43086					APPROACHES	MEETS	65% (13/20)	65% (13/20)	BELOW	
29421					BELOW	APPROACHES	45% (9/20)	65% (13/20)	BELOW	
29485					BELOW	MEETS	50% (10/20)	45% (9/20)	BELOW	
29479					APPROACHES	MEETS	65% (13/20)	90% (18/20)	APPROACHES	
41594					MEETS	MEETS	75% (15/20)	60% (12/20)	APPROACHES	
32120					APPROACHES	MEETS	65% (13/20)	60% (12/20)	APPROACHES	
46307					BELOW	APPROACHES	45% (9/20)	35% (7/20)	BELOW	
41244					MEETS	MEETS	95% (19/20)	55% (11/20)	APPROACHES	
47362					MEETS	BELOW	60% (12/20)		APPROACHES	
32655					APPROACHES	BELOW	50% (10/20)	50% (10/20)	BELOW	
31773					MEETS	MEETS	80% (16/20)	75% (15/20)	APPROACHES	
42370					MEETS	MEETS	85% (17/20)	65% (13/20)	APPROACHES	
29476					MEETS	MEETS	85% (17/20)	75% (15/20)	APPROACHES	
38054					MEETS	MEETS	85% (17/20)	80% (16/20)	MEETS	
35764					MEETS	MEETS	70% (14/20)	65% (13/20)	BELOW	
32651					MEETS	MEETS	80% (16/20)	70% (14/20)	MEETS	

*Name of Activity and Overview.* Professional development and resources for all secondary science teachers. All NCSD Science teachers received resources and equipment to support the professional development they received and facilitate NGSS aligned instruction and assessment.

*Participant Information (who, roles, how many, demographics, etc):* The following professional development opportunities were offered to all secondary science teachers.

- a. RPDP: NGSS Aligned instruction:
  - i. January 13, 2016, 10 participants
  - ii. February 28, 2017, 10 participants
  - iii. May 22-24, 2017 - Summer Workshop, 9 participants
- b. Argument Driven Inquiry Workshop, "Promoting Science Proficiency by Transforming Lab Activities," June 8-9, 2017, 5 participants
- c. Southern Nevada Science Teachers Association Spring Conference, Feb. 10-11, 2017, 8 participants
- d. Visit to NGSS aligned middle school classrooms, April 27-28, 2017, 2 participants

All 22 secondary science teachers received the following resource materials:

- *Argument-Driven Inquiry in Biology*
- *Argument-Driven Inquiry in Chemistry*
- *Argument-Driven Inquiry in Life Science*
- *Argument-Driven Inquiry in Physical Science*
- *Set: Uncovering Student Ideas in Science*, a set of books by Page Keeley.
- *Science Formative Assessment- 75 Practical Strategies for Linking Assessment, Instruction, and Learning*
- *Teaching for Conceptual Understanding in Science Everyday Physical Science Mysteries*
- *Everyday Life Science Mysteries*
- For Middle School Science teachers: *Exemplary Science in Gr 5-8*
- *Big data, small devices: investigating the natural world using real-time data*
- *Developing assessments for the next generation science standards*
- *Helping students make sense of the world using next generation science and engineering practices* (backordered, coming soon)
- *Secondary science teaching for English learners: developing supportive and responsive learning contexts for sense-making and language development* (backordered, coming soon)
- *What Principals Need to Know About Teaching and Learning Science*  
By: Eric C. Sheninger, Keith Devereaux
- *Learning by Doing: A Handbook for Professional Learning Communities at Work*, By: Richard DuFour, Rebecca DuFour, Robert Eaker, Thomas W. Many, Mike Mattos
- *Simplifying Common Assessment* By: Kim Bailey, Chris Jakicic

The following resources were purchased to support NGSS aligned instruction.

- Smart Boards (9) for secondary science classrooms that did not already have a Smart Board
- Projectors (5) for secondary science classrooms that did not already have them
- Monitors for 1 secondary science classroom
- Hover Cams for all 22 secondary science classrooms

*Area(s) of Effectiveness Measured*

*Improving Student Achievement.* The professional development and resources will help support the necessary shifts for students to be successful with Tier 1 instruction and help teachers provide the necessary supports for those students who might need further intervention to be successful.

*Assisting teachers, administrators, and other licensed educational personnel:* The resources provided will support the professional growth of the science teachers. The equipment will support the necessary shifts in instruction.

*Changes in instructional or administrative practices:* The NCSD Science Project has supported the necessary shifts in instruction to align with the Nevada State Content Standards for Science. The resources provided support those shifts.

*Improving the recruitment, selection, and retention of effective teachers and principals:* The Science Project has supported the PLC process and a student centered learning model. Providing high quality teaching resources and equipment helps teachers and will attract new teachers and retain high quality teachers.

*Effectiveness Measure for Each Area, Including Rationale for Chosen Measure:*  
We used NWEA MAP testing to track growth that middle school students are making in science and end of the course and ACT exams for high school students. Please see the data in Activity 1.

*Implications for Future Implementation:*  
NCSD will continue to develop the capacity of our science teachers through ongoing support from the Regional Professional Development Program and other appropriate professional development opportunities. For the 2017-18 school year, we are focusing our professional development around NGSS aligned assessment and supporting the science teachers in making the necessary shifts for NGSS aligned instruction.

**I. Budget Summary**

**a. Narrative Overview of Use of GTL Funds Awarded**

**b. Brief Description of Expenditures Categories and Description**

Funding paid for .25 of the new Director of Curriculum and Instruction to provide oversight for the project. Substitute teachers were hired to provide release time to middle and high school science teachers to work on the curriculum and be provided with professional development. Extra duty was also paid to teachers to work beyond their contract hours to work on the curriculum and assessments. Science teachers were trained in Argument-Driven Inquiry and the use of MasteryConnect as a real-time assessment software. Funding also purchased resources for the teachers once they began to develop the curriculum and assessments.

**c. Awarded Funds vs. Unexpended Funds, Including Narrative of All Unexpended Funds**

Nye County School District was awarded \$154,453.08 and spent \$154,336.20, leaving \$116.88. The funding that was left was \$9.37 in benefits and \$107.51 in travel.