Ohio | Department of Education

Student Learning Objective (SLO) Template

*This template should be completed while referring to the **SLO Template Checklist Document**.*

Teacher Name: Special education teacher in resource classroom
Content Area and Course(s): Science Grade Level(s): 9th and 10th grade self-contained special education resource classroom - physical science class
Academic Year: 2013–14

Please use the guidance provided in addition to this template to develop components of the SLO and populate each component in the space below.

Baseline and Trend Data

What information is being used to inform the creation of the objective and establish the amount of growth that should take place within the time period?

My special education resource room is comprised of 12 students who receive special education services and are identified as students with an emotional disability. Four of my students are 9th graders and eight students are 10th graders. My students are in my resource room for two periods a day, while mainstreamed for the remaining four periods throughout the day. For the purpose of this SLO, I'm focusing on the science class that I teach for my students in the resource room for 30 minutes each day.

The following are results from the students' performance on the Grades 8 and 9 district-created physical science exams for the previous year before joining my classroom. The exams cover the use of inquiry in the study of matter, energy and waves, forces and motion, and the universe, the four course content areas as identified in the Ohio's Learning Standards High School Physical Science and Model Curriculum for High School Physical Science. The exam is scored on a 100 point scale and the scoring guide indicates that any score between 0 and 50 is considered "low achievement," any score between 51 and 70 is considered "moderate achievement," and any score above 70 is considered "high achievement."

Performance on the Grade 9 District Physical Science Exam Administered April 2013	
Student A	22/Low Achievement
Student B	54/Moderate Achievement
Student C	33/Low Achievement
Student D	64/Moderate Achievement
Student E	60/Moderate Achievement
Student F	30/Low Achievement
Student G	28/Low Achievement
Student H	41/Low Achievement

Performance on the Grade 8 District Physical Science Exam Administered April 2013	
Student I	44/Low Achievement
Student J	56/Moderate Achievement
Student K	31/Low Achievement
Student L	20/Low Achievement

Summary: On last year's assessment, eight out of 12 students demonstrated low achievement. The remaining four students demonstrated moderate mastery. The areas of strength across all students include using technology in science and communicating scientific arguments. Areas of weaknesses include designing and conducting scientific investigations (for six of the students) and recognizing and analyzing explanations and models (for six of the students).

Trend Data: In addition, following are the results of the 10th graders with emotional disturbance in physical science class from the 2012–13 school year. The special education teacher only had 10th graders in the last cohort of students. This table shows the students' scores on the same exam in the year prior to our class and their results at the end of our class.

	Score on Grade 9 Physical Science Assessment in previous year—April 2012	**Score on Grade 10 Physical Science Assessment at end of current year—April 2013**	**Difference**
Student T	40	43	+3
Student U	31	37	+6
Student V	19	31	+12
Student W	27	35	+8
Student X	55	59	+4
Student Y	48	55	+7
Student Z	20	30	+10

Summary: All seven students made gains on their scores from one year to the next, with an average gain of approximately 7 index points. Students who started out at low achievement (20 points and below) were able to make much larger gains than students who started out at moderate-level achievement. Unlike the current set of students, these students initially had strengths in identifying concepts that guide scientific investigations, but were weak in communicating scientific arguments.

Student Population

Which students will be included in this SLO? Include course, grade level, and number of students.

This SLO covers 12 students who are identified with an emotional disability, including eight 10th graders and four 9th graders. No students or subgroups are excluded from this SLO. All students have been diagnosed with a slight degree of ADHD. Six students have reading difficulties, which include difficulties with reading comprehension. These students have test questions and directions read to them, and they use a dictionary as part of their accommodations. Two students have been diagnosed with dyscalculia and thus need additional support in math and science. All students have IEPs and receive support from specialists in the school, including social workers who conduct counseling and special education aides who provide coaching in reading and mathematics. The exams are administered with accommodations in accordance with each student's IEP.

Interval of Instruction

What is the duration of the course that the SLO will cover? Include beginning and end dates.

For the purpose of this SLO, the duration of the course is from September 1, 2013, through April 15, 2014. The students are in the self-contained classroom for two periods a day, with a focus on science for 30 minutes a day. They have one class in each of the four core subjects (English, math, social studies, and science) for the other four periods, including physical science. I (or a special education aide) am usually with the students in their regular classes. The students will be taking the district physical science exam in my classroom in April 2014.

Standards and Content

To what related standards is the SLO aligned?

The content of this SLO aligns with Ohio's Learning Standards for High School Physical Science. This SLO will focus on the four content areas of Physical Science through the lens of Science Inquiry and Application. The process of scientific inquiry incorporates universal skills, such as collaboration, critical thinking, problem solving, communication, research, and meta-cognition, which are commonly thought of as 21st century process skills. Teaching by inquiry allows students to learn and demonstrate both scientific skills and technological/engineering design skills, which address the goal of career and college readiness.

<u>Science Inquiry and Application</u>

During Grades 9 through 12, all students must use the following scientific processes with appropriate laboratory safety techniques to build their knowledge and understanding in all science content areas:

• Identify questions and concepts that guide scientific investigations
• Design and conduct scientific investigations
• Use technology and mathematics to improve investigations and communications
• Formulate and revise explanations and models using logic and evidence (critical thinking)
• Recognize and analyze explanations and models
• Communicate and support a scientific argument

Ohio educators are provided with the content and expectations for learning upon which to base science curriculum at each grade level. By the end of high school, students should graduate with sufficient proficiency in science to:

- Know, use and interpret scientific explanations of the natural world;
- Generate and evaluate scientific evidence and explanations, distinguishing science from pseudoscience;
- Understand the nature and development of scientific knowledge;
- Participate productively in scientific practices and discourse.

The blending of the Content Statements and Content Elaborations with the Expectations for Learning (Cognitive Demands) will provide the basis for future assessments. Thus, in order to focus specific attributes of content to be measured for this SLO, I've selected areas from the Test Specifications for Physical

Science for each of the content areas. These statements provide specific information around expectations for student performance within Physical Science in each of the four content areas. I've selected those components that are most critical for my group of students based upon strengths and weaknesses as noted above.

Study of Matter	Forces and Motion	Energy and Waves	The Universe
Given data, justifying conclusions from the results of an experiment for periodic trends.	Given a real-world scenario, interpreting position vs. time, velocity vs. time graphs, and/or motion diagrams.	Planning an experiment to determine the amount of energy transferred through work on a system	Analyzing evidence supporting the Big Bang Model or Hubble's Law
Writing and balancing equations using IUPAC names and formulas for chemical compounds relating it to the conservation of matter.	Designing an experiment using dynamics to determine a specific force in a given system of forces (e.g., friction force from spring scale).	Designing or improving a system that involves work and energy transformation that meets certain constraints (e.g., height, speed, force, displacement).	Comparing spectroscopic data indicating the Doppler shift of various galaxies to determine relative motion.
Designing a solution to a real-world problem involving mixtures that need to be separated based on solubility, density, and/or boiling/melting point.	Designing or critiquing solutions to engineering problems involving forces and motion.	Designing or developing applications of electric circuits to a real-world scenario.	Interpret the HR diagram in terms of mass, luminosity, temperature and evolutionary stages of the main sequence stars.
Comparing the strengths and weaknesses of designs to determine the identity of an unknown substance based on solubility, density, and/or boiling/melting point.	Designing an experiment to measure the velocity of objects in a real-world scenario.	Explaining observed changes in current and voltage in a circuit in terms of electrons and energy transfer.	

These standards articulate developmentally appropriate yet rigorous expectations for students in the Physical Science classroom.

Assessment(s)

What assessment(s) will be used to measure student growth for this objective?

Student growth for this objective will be measured by their performance on the district-created Physical Science exam in Grades 9 and 10. The exam aligns with all four course content areas and assesses students using a combination of multiple choice and performance based questions. All students will receive accommodations for the exam in accordance with their IEPs, which includes extended time on the exam, having directions read aloud, and the use of a dictionary during the exam. The exam aligns with the Ohio's Learning Standards for Physical Science. This exam has been vetted with curriculum specialists and the district assessment department and has been reviewed for sufficient stretch, validity, and reliability. My students require significant individualized instruction per their IEPs, and the growth targets take into account their special needs.

Growth Target(s)

Considering all available data and content requirements, what growth target(s) can students be expected to reach?

Students will be expected to attain the following growth targets on the district physical science exam based on prior achievement of previous students in my class:

Growth Target	
Previous year's score on the district physical science exam—administered April 2013	**Target score on the district physical science exam—administered April 2014**
30 and below/Low Achievement	Growth of at least 12 points
31–40/Low Achievement	Growth of at least 10 points
41–50/Low Achievement	Growth of at least 8 points
51–60/Moderate Achievement	Growth of at least 6 points
Above 60/Moderate Achievement	Growth of at least 5 points

Students performing at the lowest band are expected to grow more than their peers in order to be on target to reaching proficiency on the course content standards.

Rationale for Targeted Student Growth Within the Interval of Instruction

What is your rationale for setting the above target(s) for student growth within the interval of instruction?

I determined these growth targets based on the growth of my former students on last year's performance assessments (see table in Baseline and Trend Data). Because students are using the district physical science exam that aligns with these standards, it is appropriate to expect them to improve on their performance from the previous year on the same strands of the High School Physical Science Learning Standards.

These growth targets expect all students to improve on their score, while not necessarily reaching the level of "moderate" or "high" achievement levels, as they take into account students' current academic levels. I have created these targets in consultation with the district special education coordinator and the science department chair to ensure that these targets are appropriate yet rigorous.

I also have chosen to concentrate on Performance Based tasks and strategies as identified in the content of this SLO because of its focus on critical thinking, which forms the building blocks of research-oriented thinking. This is a critical skill for students about to graduate from high school and go on to the workforce or college courses. Employers are constantly seeking candidates with critical thinking skills, and research is embedded in many college courses. In order for these students to be successful beyond high school, the processes involved in the designing of experiments and analysis as noted above will further augment their skill set.

In addition, Ohio's Learning Standards for English Language Arts (ELA) identifies an increase in research as one of the key shifts for ELA. As a result, our building principal has identified an increase in research skills as a goal for our building. Therefore, this SLO aligns to one of our building goals for 2013-2014.