

Creating Access to Grade Level Science Curriculum for Students with the Most Significant Cognitive Disabilities

Students with severe cognitive disabilities must be provided with access to grade level curriculum. Access means academic progress. Thus, educators are providing more meaningful access to the general curriculum via effective teaching practices and collaboration to help students with significant cognitive disabilities make progress towards achieving grade level content standards.

These students' learning needs can be addressed within the standards by focusing on the essential concepts of the benchmarks and/or on the underlying skills necessary to reach the standards. The process to identify the essential concepts students will need to learn and the alternate ways he/she can demonstrate learning is the process used to develop the Wyoming Science Academic Content Standards. All students can achieve higher levels. The academic benchmarks can support educational teams to ensure that standards, assessment, curriculum and instruction are aligned and meet the unique needs of individual students.

The Academic Content Standards are presented in a three column format. The first column is a statement of each Wyoming State Benchmark in science. The second column is a statement of the essence of the Wyoming State Benchmarks written as an Academic Benchmark based on grade level content but are somewhat reduced in breadth and depth from the grade level expectations. The increasing Levels of Complexity of the Academic Benchmark are described with examples, in some cases, in the last column. Levels of Complexity are defined for each unique Academic Benchmark at all grades. These are intended to address at the range of cognitive demand required of students eligible to participate in alternate assessments.

Standard:

Concepts and Processes: Life Systems

Benchmark:

Characteristics of Organisms: Students describe observable characteristics of living things, including structures that serve specific functions and everyday behaviors.

Academic Benchmark:

4.E.S.1.1 Students demonstrate which features of living organisms serve specific functions.

Levels of Complexity include, but are not limited to the following:

- Attention – responding, listening, gaining/maintaining attention
- Recall – describing, responding to others expressing self
- Performance - following direction, locating
- Comprehension – grouping, restating
- Application – collecting, operating

Attending is a critical access skill that all learners must have to gain information from their environment. An academic benchmark based on an grade level linked academic skill might look like:

Level I:**Students recognize features of human beings.**

Ex. Students respond by using eye gaze or verbalizations to a representation of features of a human face.

The Wyoming Academic Science Content Standards are composed of three strands: Concepts and Processes, Science as Inquiry, and History and Nature of Science in Personal and Social Decisions. To consider whether your current activities address science content, consider two criteria: 1) would general education teachers teach this content, and 2) would a science teacher agree that the science construct is clearly represented.

The Design of the Science Alternate Assessment

The Wyoming PAWS-ALT includes science items taken from all three strands. However, not *all* academic benchmarks will be assessed. The Science PAWS-ALT is based upon Wyoming's Science Academic Content Standards and was developed to mirror the general education PAWS where appropriate. The Science PAWS-ALT contains three distinct components: Data Collection of Student Work (DCSW), Teacher Observation of Academic Skills (TOAS), and a set of Student Performance Events (SPE). Each component is intended to be grade-span-specific and linked to the Science Academic Content Standards. Each student participating in the science PAWS-ALT will be assessed in all three components for each subject assessed.

The assessment target and skill focus of the PAWS-ALT is inquiry. Student inquiry involves students investigating something they do not understand or a problem, with students interacting with the question, variables, and procedure relating to the problem.

Different levels of inquiry exist, depending on teacher and student background.

Stages of Inquiry

1. NO inquiry - Teachers define the question, the procedure and dictate the expected answer to the students.
2. Structured Inquiry - Teachers provide the question and procedure, but NOT the answer, which may not be obvious to the students.
3. Guided Inquiry - Teachers provide the question/problem, but not the procedure nor answer.
4. Open - Students provide question, procedure and answer.

The science PAWS-ALT utilizes Structured Inquiry.

The teacher establishes parameters and procedures for inquiry. Students are provided with a hands-on problem to investigate as well as the procedures and materials necessary to complete the investigation. Teachers provide the question and procedure, but NOT the answer, which is not obvious to the students. It's a misconception that students are not given guidance in inquiry based learning. Students discover relationships between variables or generalize from data collected, which in essence leads to the discovery of expected outcomes. The value in using structured inquiry is it allows the instructor to teach students the basics of investigating as well as techniques of using various equipment and procedures that can be used in later more complicated investigations. In other words, structured inquiries provide students with common learning experiences.

Steps for Structured Inquiry

Introduction to the Task

- Demonstrate the Phenomenon
- Elicit Prior Knowledge
- Ask students what they would do to show the correctness of their ideas or beliefs and encourage them to carry out any procedure which they suggest

Explain the Task

- Assure that the Student understands the task
- Inform the student that they have to tell you when they're ready

Begin the Inquiry

- When the student signifies readiness provide an example for them to test their idea
- Determine that the Student can go no further Unassisted
- Provide Guidance

Obtain a summary conceptualization of the Phenomenon

- Drawing conclusions through data analysis, considering alternative arguments
- Communicating results

Four Steps to Access

I. Identify the link to the appropriate standard:

What Are a Plant's Parts?

- **4.E.S.1.1 Students demonstrate which features of living organisms serve specific functions.**

II. Define the Outcome(s) of Instruction:

Learning Outcomes

- Plants grow in a variety of shapes and sizes .
- Each main part (root, stem, leaf, and flower) has a special function.
- Plant parts vary in shape, size, and color.
- This diversity is linked to adaptations to specific conditions and habitats.

Background Information

- Most plants have a similar structure: They are composed of roots, stems, leaves, and flowers. Each part serves a critical function for the plant:
- Roots absorb and store water and minerals, and anchor the plant in place.
- Stems move water and minerals up from the roots, and sugars (plant food) down from the leaves. Stems also support the plant above ground, and, like roots, can store water and food.
- Leaves are the plant's food factories, where light is combined with water and carbon dioxide to make sugar.
- Flowers help make new plants by producing pollen to fertilize other flowers.

Other Information:

- Flowers grow into seeds, which are contained inside a fruit. The seeds can grow into new plants.
- Roots can grow in many shapes and sizes. They can grow as a thick underground taproot; as a network of fine hair-like fibers, above ground or floating on the water; and even in the air, hanging down from a tree or clinging to a wall or tree trunk.
- Stems can be tall or short, stiff and woody with thick bark, or soft and flexible.
- Leaves can be pointed like a pine needle or round. In texture they range from fuzzy to silky smooth. Leaf size can vary from big to tiny.
- Leaves come in a rainbow of colors.
- Flowers are colorful and fragrant, like roses.
- Roots that are deep help the plant access underground water; roots that are shallow absorb nutrients and moisture near the surface.

III. Identify the Instructional Activities

Preliminary Activities

- List the parts of a plant.
- Label a diagram of a plant, including all the parts and describe the function of each.

Possible Inquiry Activities

- Gently feel the parts of different plants to compare their textures. Notice the differences, as well as similarities in color, size, and shape.
- Smell and compare the fragrance of different flowers and leaves. Describe the smell, or compare it to something familiar, such as perfume, powder, or a holiday wreath.
- Search for and draw each plant part. Guess what job each part plays in helping the plant survive.
- Find several examples of the same plant part that look very different.
- Through observation, try to predict how certain plant parts will feel.
- Confirm hypotheses using a gentle touch.
- Report findings using descriptive words.
- Record how many different kinds of flowers, stems, leaves, and roots can be found.
- Name and label a plant using words that describe how it looks, smells, or feels.
- Sort and display the plants by their different characteristics. Discuss how they are organized.

Descriptive terms:

- Roots: Are they delicate, hairy, smooth, long, short, thick, thin, bumpy, brown?
- Stems: Are they thick, thin, tall, short, fuzzy, smooth, rough, green, brown?
- Leaves: Are they dark green, round, pointed, yellow, orange, pink, hairy, waxy, leathery?
- Flowers: Are they colorful, white, bright, dull, fragrant, sweet smelling, delicate?

IV. Target Specific Objectives from the IEP

- Plan how to provide direct instruction on IEP skills based on academic content standards