Connecticut Alternate Science (CTAS) Assessment

Interpretive Guide

2022 Test Administration

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Contents

Introduction to the Connecticut Alternate Science Assessment

Introduction

The Connecticut Alternate Science (CTAS) Assessment based on alternate achievement standards (AA-AAS), was developed to ensure that all students, including those with significant cognitive disabilities, are able to participate in an assessment that is a measure of what they know and can do in relation to content derived from Connecticut's grade-level science content standards. The CTAS is designed to meet the requirements of the Elementary and Secondary Education Act (ESEA), Individuals with Disabilities Education Act (IDEA), the Every Student Succeeds Act (ESSA), and Connecticut General Statutes. These laws mandate that all students participate in assessments that measure student achievement on grade-level content standards.

The CTAS is a non-secure statewide science assessment for eligible students with significant cognitive disabilities in Grades 5, 8, and 11. This alternate assessment consists of a series of grade-specific science activities that are administered individually by the student's trained teacher in a classroom setting over the course of the school year. These activities can complement science instruction throughout the year and allow for a more natural integration with science curriculum and learning. As the activities are administered, the teacher rates student responses according to scoring and content guidance provided in the grade- and content-specific Performance Task documents using a Student Score Worksheet. Prior to the end of the testing window, the teacher submits the student ratings online through the Data Entry Interface (DEI) for scoring and reporting.

Purpose

The Next Generation Science Standards (NGSS) Assessments are Connecticut's statewide mastery examination for science in Grades 5, 8, and 11. They provide an efficient and reliable estimate of a student's overall performance in science relative to grade-appropriate standards that enables valid interpretations of student achievement and progress. The NGSS Assessments include both the standard tests (often referred to as the NGSS assessments) taken by the majority of students, as well as the Connecticut Alternate Science (CTAS) Assessment, administered to a small population of eligible students with a significant cognitive disability.

This CTAS Assessment Interpretive Guide is designed to help educators, parents, students, and members of both the public and the media understand and properly explain the results of the CTAS Assessment. This guide provides general information to consider when analyzing the data to ensure proper interpretation and use of these data to inform decisions around classroom instruction, curricula, and professional development.

How are the Results Used?

The primary purpose of the state's summative examination is to provide an efficient and reliable estimate of a student's overall performance in a subject area relative to grade-appropriate standards that enable valid interpretations of student achievement (in all tested grades and subjects) and progress (in Grades 4 through 8 for ELA and Mathematics). In the aggregate (e.g., district, school, grade level), results from the statewide summative assessment

provide one valid and reliable indication of the academic achievement and progress attained by students. Such aggregate results tell us if all students–regardless of zip code, family income, dominant language, or disability–are achieving and making progress academically.

Aggregate results from the summative assessment can inform federal/state reporting, district/school accountability, program evaluation at state/district/school levels, educator evaluation and support, and district/school identification for support and recognition. As with an individual student, aggregate results from the statewide summative assessment are an important indicator of academic achievement and progress, but not the only one. In the Next Generation Accountability System for districts and schools and in the educator evaluation and support system, state mastery examination scores are not the only indicator; other indicators are included to provide a more holistic picture.

The statewide summative assessment is an important indicator of student achievement and progress, but it is not the only one. Subsection (e) of C.G.S. Section 10-14n appropriately prohibits the use of the "mastery examination" results as the sole criterion for student promotion or graduation. Sec. 10-223a states that each local and regional board of education shall specify the basic skills necessary for graduation for classes graduating in 2006, and for each graduating class thereafter, and include a process to assess a student's level of competency in such skills. The assessment criteria shall include, but not be exclusively based on, the results of the mastery examination, pursuant to section 10-14n, for students in grade ten or eleven. Connecticut does not offer an alternate diploma. Students who are eligible to take the alternate assessments based on their IEP can demonstrate competency on their core courses and graduate.

Student Participation

Students identified as special education students, who have been determined eligible by their Planning and Placement Team (PPT) for participation in the CTAS, base the decision on the required criteria defined below. Eligible students in Connecticut's Alternate Assessment System participate in the Connecticut Alternate Assessment (CTAA) for English language arts and mathematics in Grades 3 through 8 and Grade 11, and the Connecticut Alternate Science Assessment in Grades 5, 8, and 11.

The criteria for student participation in the Alternate Assessment System (both CTAA and CTAS) reflects the pervasive nature of a significant cognitive disability. All content areas should be considered when determining who should participate in this assessment. The following table shows the participation criteria and the descriptors used to determine eligibility for participation for each student. The criteria are incorporated into the Connecticut Alternate Assessment Eligibility Form used to register students for the alternate assessments.

Participation Criteria	Participation Criteria Descriptors

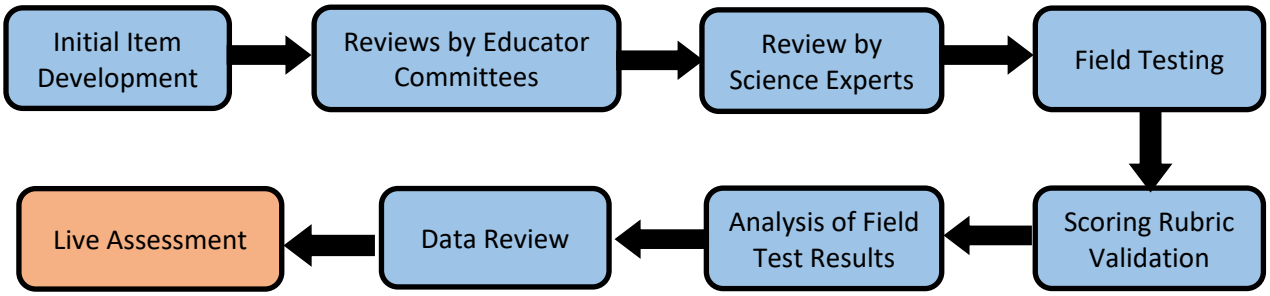
1. The student has a significant cognitive disability.	Review of student records indicates evidence to support an intellectual impairment. Evidence includes results of cognitive testing with a Full Scale IQ score less than 70. If such cognitive assessments/scores are not available, there is evidence to substantiate the presence of an intellectual impairment throughout the Individualized Education Program (IEP).
2. The student has adaptive behavior skills well below age-level expectations. * Adaptive behavior is defined as skills essential for someone to live independently and to function safely in daily life.	Review of student records indicates evidence to support the student does not demonstrate conceptual, social and practical skills necessary to meet common demands of everyday life across multiple settings independently or safely. Evidence includes adaptive behavior skills assessment scores more than 1.5 standard deviations below the mean score.
3. The student requires extensive instruction and significant supports.	The student requires extensive, repeated, instruction and support that is not of a temporary or transient nature, and uses substantially adapted materials and individualized methods of accessing information in alternative ways to acquire, maintain, generalize, demonstrate, and transfer skills.

Development Process of the CTAS Assessment

Connecticut mandates that all public school students enrolled in Grades 5, 8, and 11 participate in statewide State Board of Education approved testing that measures essential and grade-appropriate knowledge and skills in science.

> "Connecticut General Statute (Section 10-14n) (3) provision that for the school year commencing July 1, 2018 and each school year thereafter, each student enrolled in grades five, eight and eleven in any public school shall annually take a state-wide mastery examination during the regular school day."

The Next Generation Science Standards were adopted by the Connecticut State Board of Education in November 2015. The CTAS was developed by the Connecticut State Department of Education (CSDE) along with educators in Connecticut and field tested in spring 2018, with full implementation during the 2018–2019 school year. This Connecticut-developed test was intended to best meet the needs for students who would be eligible for an alternate assessment.



Beginning in 2015, stakeholders from across Connecticut worked with the CSDE to inform the development of an alternate assessment for science. Guiding principles to support the content and access needs of eligible students with significant cognitive disabilities were developed. These guiding principles provided the structure for the CTAS Committee, which was composed of individuals with expertise in science, teaching students with significant cognitive disabilities, or both, to develop and design this alternate assessment. The guiding principles described that the CTAS should do the following:

- Be meaningful and accessible to participating students
- Guide science curriculum and instruction
- Allow for administration of the assessment throughout the year
- Include an appropriate balance of the breadth and depth of NGSS Learning Progressions across grade bands
- Assess the three dimensions of NGSS:
  - Science and Engineering Practices
  - Disciplinary Core Ideas
  - Cross-cutting Concepts
- Incorporate scientific phenomena that students make sense of, or use to solve a problem
- Support consistent demonstration of the Performance Expectations by students statewide

With the guiding principles in mind, the CTAS Committee participated in each component of assessment development and volunteered their time and expertise in the development of the assessment. During the fall of 2017, the CTAS Committee identified the NGSS Performance Expectations that are most appropriate for students who are eligible to participate in the CTAS. Committee members also assisted in the creation of Essence Statements and Core Extensions (which are further described in this guide). Prior to field testing, the CTAS Committee reviewed/developed initial Performance Task ideas, designed Storylines and corresponding activities and investigations, and offered expertise on scaffolding and the teacher script. Following field testing in spring 2018, the CTAS Committee reviewed and recommended revisions for a subset of Performance Task materials, while the CSDE collected extensive teacher feedback for discussion and potential action following the 2018 field test administration.

At each tested grade, the CTAS is comprised of six Performance Tasks consisting of a Storyline capturing the NGSS Performance Expectations, Essence Statements, and Core Extensions within a specific content area. Each Storyline outlines the following components used to inform the development of the Performance Task:

- There are a series of Guiding Questions for each Performance Task.
- Standard NGSS Performance Expectations are used to derive Connecticut Alternate Science Essence Statements.
- Essence Statements define the derived core understandings embedded in the grade-level NGSS Standard Performance Expectations, making the Standard Performance Expectation accessible and achievable by students with significant cognitive disabilities.
- Core Extensions describe specific student performances and are connected to activities that are administered to the student by the Trained Teacher Administering the Alternate Assessments (TEA).

Each storyline bundles together 2–4 Performance Expectations from the grade band that are conceptually related to each other and represent key NGSS Assessment targets (see Table 1).

Grade-specific Performance Tasks include:

- A Guiding Question and a general overview of the task (see Figure 1)
- A list of materials needed and instructions for preparing materials (see Figure 2)
- Step-by-step activities with built-in script and scaffolding for trained teachers (TEAs) (see Figure 3)
- Scoring guidance for each activity (see Figure 4)

Table 1: CTAS Storylines and Performance Tasks

Content Area	Storyline Number	Storyline and Performance Task	Grade-Level Performance Task (PT)
Earth Science	1	Earth Systems	Grade 5
			Grade 8
			Grade 11
	2	Natural Resources	Grade 5
			Grade 8
			Grade 11
Life Science	3	Living Organisms	Grade 5
			Grade 8
			Grade 11
	4	Healthy Ecosystems	Grade 5
			Grade 8
			Grade 11
Physical Science	5	Forces and Motion	Grade 5
			Grade 8
			Grade 11
	6	Using Energy Every Day	Grade 5
			Grade 8
			Grade 11

Essence Statements and Core Extensions

Essence Statements, derived from the Performance Expectations (PE), define the core

understandings embedded in the PE. The Essence Statements, which make the assessment more accessible and appropriate for students with significant cognitive disabilities, are broken down into Core Extensions that describe a series of student activities through which the student demonstrates understanding. As trained teachers administer the Performance Tasks, they rate student performance on the Core Extension using a general rating scale (0–2 points). Details of this relationship are illustrated in this graphic.

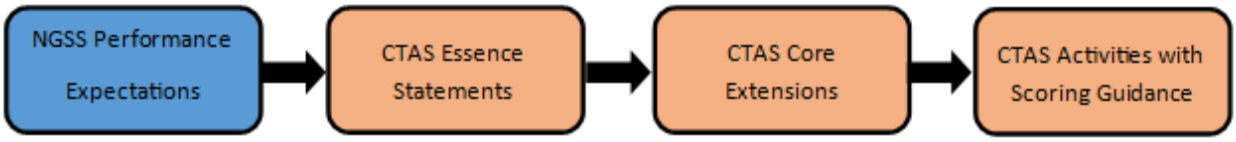


Figure 1: Excerpt of a Grade 8 Earth Science Performance Task and Its Alignment to the NGSS Learning Progressions and NGSS Performance Expectations

Connecticut Alternate Science Assessment

Earth Science
Storyline 1: Earth Systems
Grade 8 Performance Task

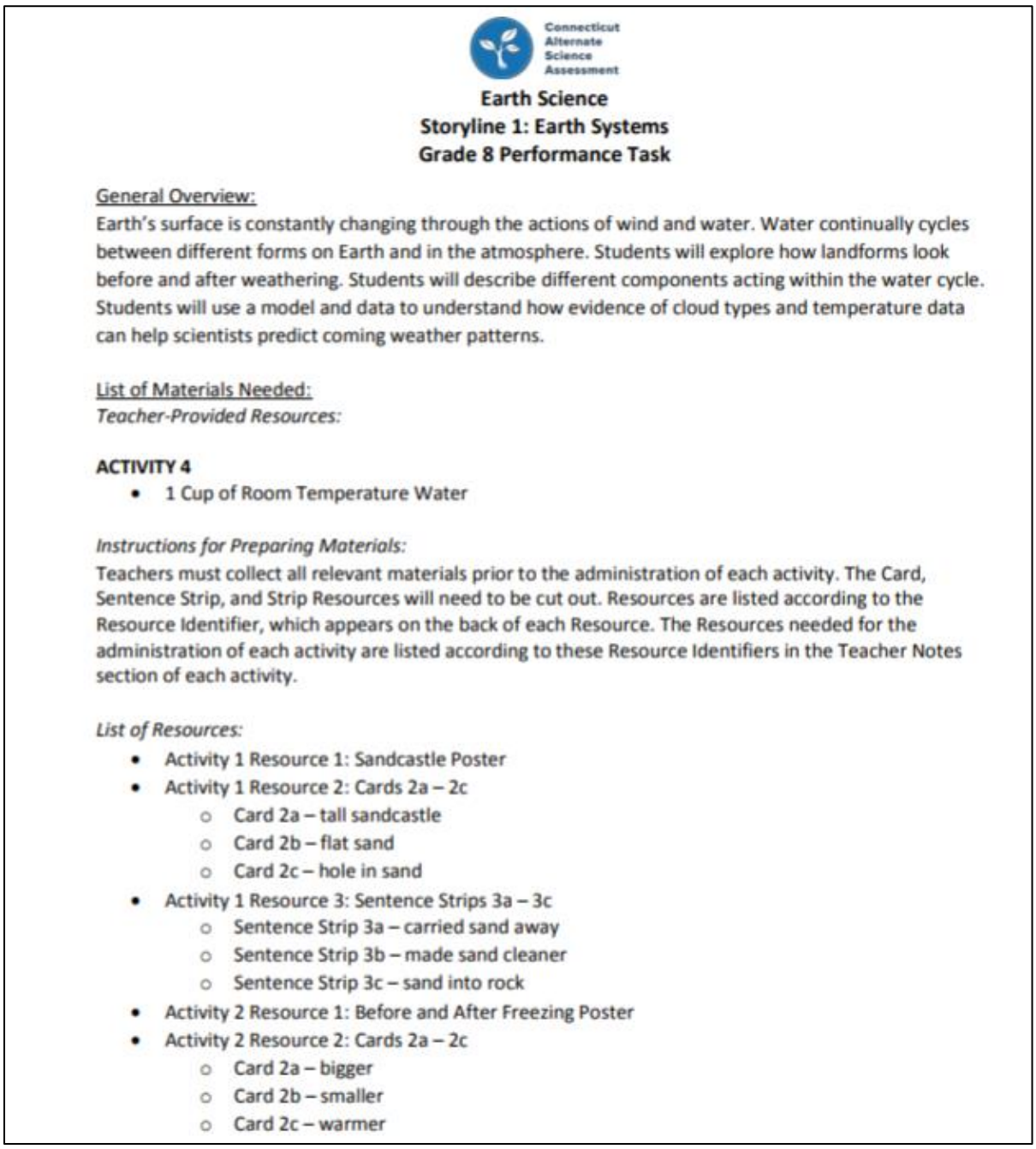
Guiding Questions: How do water and wind affect the Earth's surface? How does water move through the Earth's atmosphere and land? What factors affect the weather?

NGSS Learning Progressions	Grade 8		
	NGSS Standard Performance Expectations	**Connecticut Alternate Science Essence Statements**	**Core Extensions**
ESS2.C The Roles of Water in Earth's Surface Processes	MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	CTAS-MS-ESS2-2 Construct an explanation based on evidence for how the movements of water, ice, and wind can change the Earth's surface. CTAS-MS-ESS2-4 Use a model to explain how the sun's energy and gravity cause water to cycle between the land and the atmosphere.	1. From provided visuals, identify the effect of waves on a beach over time. (CTAS-MS-ESS2-2) 2. From provided visuals, describe how ice freezing and melting can change the land. (CTAS-MS-ESS2-2) 3. Construct an explanation based on provided evidence for how wind changes a landform on the Earth's surface. (CTAS-MS-ESS2-2) 4. Provide examples showing that water can exist as a solid, a liquid, or a gas, depending on its temperature. (CTAS-MS-ESS2-4) 5. From given components, complete a model of the water cycle by describing the relationships among the components (i.e., evaporation of water on land → condensation/cloud formation → precipitation of rain or snow → falls back to the land). (CTAS-MS-ESS2-4) 6. Given a model of the water cycle, describe the effect that the sun's energy (heat) and the Earth's gravity have on water. (CTAS-MS-ESS2-4)
ESS2.D Weather and Climate	MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.	CTAS-MS-ESS2-5 Use data to provide evidence of atmospheric conditions that result in precipitation.	

The Overall Format of the Performance Tasks

As described in this guide, the Performance Tasks are comprised of a series of activities that are administered by the trained teacher to explore an overarching topic framed by a Guiding Question. The teacher will use the directions in the Performance Task to plan and prepare for the administration of the task, which may include the gathering of specific materials that are included in the Resource Packet, as well as additional ancillary materials that are specified by the Performance Task. A sample from a grade 8 Earth Systems is included below to illustrate the General Overview, List of Materials, General Instructions, and a list of resources needed to administer the activities.

Figure 2: Excerpt of a Grade 8 Earth Science Performance Task and its General Overview for Test Administration



Connecticut Alternate Science Assessment

Earth Science
Storyline 1: Earth Systems
Grade 8 Performance Task

General Overview:
Earth's surface is constantly changing through the actions of wind and water. Water continually cycles between different forms on Earth and in the atmosphere. Students will explore how landforms look before and after weathering. Students will describe different components acting within the water cycle. Students will use a model and data to understand how evidence of cloud types and temperature data can help scientists predict coming weather patterns.

List of Materials Needed:
Teacher-Provided Resources:

ACTIVITY 4

- 1 Cup of Room Temperature Water

Instructions for Preparing Materials:
Teachers must collect all relevant materials prior to the administration of each activity. The Card, Sentence Strip, and Strip Resources will need to be cut out. Resources are listed according to the Resource Identifier, which appears on the back of each Resource. The Resources needed for the administration of each activity are listed according to these Resource Identifiers in the Teacher Notes section of each activity.

List of Resources:

- Activity 1 Resource 1: Sandcastle Poster
- Activity 1 Resource 2: Cards 2a – 2c
  - Card 2a – tall sandcastle
  - Card 2b – flat sand
  - Card 2c – hole in sand
- Activity 1 Resource 3: Sentence Strips 3a – 3c
  - Sentence Strip 3a – carried sand away
  - Sentence Strip 3b – made sand cleaner
  - Sentence Strip 3c – sand into rock
- Activity 2 Resource 1: Before and After Freezing Poster
- Activity 2 Resource 2: Cards 2a – 2c
  - Card 2a – bigger
  - Card 2b – smaller
  - Card 2c – warmer

The embedded tasks are scripted and guide the teacher through each activity to ensure the organization and standardization of each task (see Figure 3). The script also includes scoring and scaffolding guidance to further support student access to the questions embedded within the Performance Task (see Figure 4).

Figure 3: Grade 8 Earth Science Performance Task Script

Connecticut Alternate Science Assessment

ACTIVITY 1

Essence Statement: CTAS-MS-ESS2-2 Construct an explanation based on evidence for how the movements of water, ice, and wind can change the Earth's surface.

Core Extension 1: From provided visuals, identify the effect of waves on a beach over time. (CTAS-MS-ESS2-2)

Teacher Notes:

Collect the following resources for this activity:

- Activity 1 Resource 1: Sandcastle Poster
- Activity 1 Resource 2: Cards 2a – 2c
  - Card 2a – tall sandcastle
  - Card 2b – flat sand
  - Card 2c – hole in sand
- Activity 1 Resource 3: Sentence Strips 3a – 3c
  - Sentence Strip 3a – carried sand away
  - Sentence Strip 3b – made sand cleaner
  - Sentence Strip 3c – sand into rock

Steps to Follow:

1. | **SAY** | "In this activity, we are going to talk about some ways that water can change Earth's surface." |

2. Display Resource 1: Sandcastle Poster for the student.
3. Indicate Resource 1.

SAY	"A boy builds a sandcastle on a beach *(indicate the first box)*. After a while, the ocean waves came closer and closer to the sandcastle. The second picture shows the sandcastle after the first wave hit the sandcastle *(indicate the second box)*."

4. | **ASK** | "Which picture shows how the sandcastle will change after several waves hit it?" |

5. Provide Resource 2: Cards 2a – 2c to the student. Indicate and read each Card.

a. Indicate Card 2a.

SAY	"tall sandcastle"

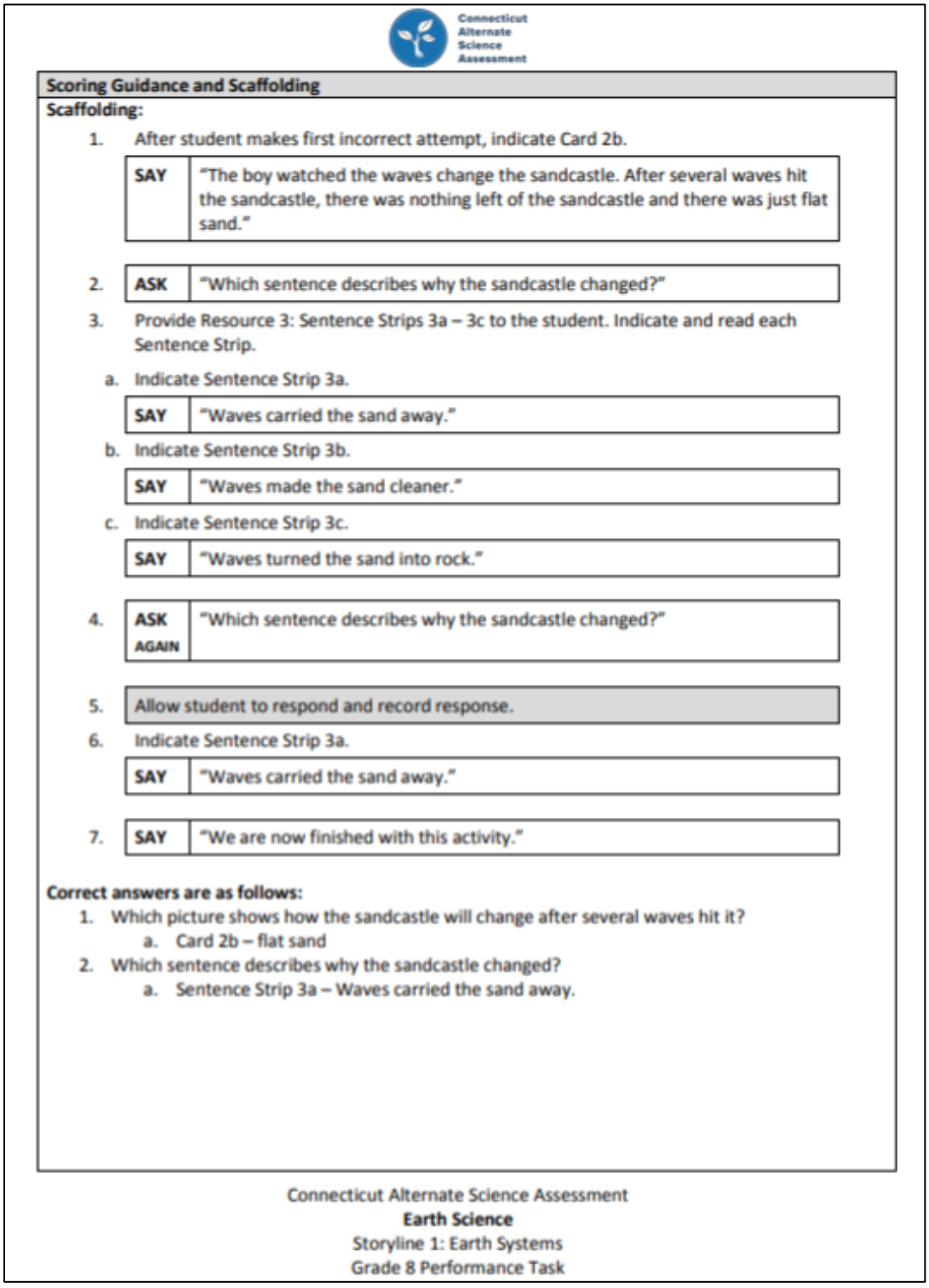
b. Indicate Card 2b.

SAY	"flat sand"

c. Indicate Card 2c.

SAY	"hole in the sand"

Figure 4: Grade 8 Earth Science Performance Task Scoring Guidance and Scaffolding



Connecticut Alternate Science Assessment

Scoring Guidance and Scaffolding

Scaffolding:

1. After student makes first incorrect attempt, indicate Card 2b.

SAY	"The boy watched the waves change the sandcastle. After several waves hit the sandcastle, there was nothing left of the sandcastle and there was just flat sand."

2.

ASK	"Which sentence describes why the sandcastle changed?"

3. Provide Resource 3: Sentence Strips 3a – 3c to the student. Indicate and read each Sentence Strip.

   a. Indicate Sentence Strip 3a.

SAY	"Waves carried the sand away."

   b. Indicate Sentence Strip 3b.

SAY	"Waves made the sand cleaner."

   c. Indicate Sentence Strip 3c.

SAY	"Waves turned the sand into rock."

4.

ASK AGAIN	"Which sentence describes why the sandcastle changed?"

5. Allow student to respond and record response.

6. Indicate Sentence Strip 3a.

SAY	"Waves carried the sand away."

7.

SAY	"We are now finished with this activity."

Correct answers are as follows:

1. Which picture shows how the sandcastle will change after several waves hit it?
   a. Card 2b – flat sand
2. Which sentence describes why the sandcastle changed?
   a. Sentence Strip 3a – Waves carried the sand away.

Connecticut Alternate Science Assessment
Earth Science
Storyline 1: Earth Systems
Grade 8 Performance Task

Resource Packets

Resource Packets are specific to each Performance Task, and include materials such as posters, graphs, and sentence strips that are presented to the student based on the instructions in the Performance Task (see Figure 5). Initial printed color copies were provided to districts to share and use over multiple years. Digital versions to create additional copies or to incorporate into assistive technology are available on the Connecticut Comprehensive Assessment Program Portal.

Figure 5: Sample Grade 8 Earth Science Resource Card: Connecticut Alternate Science Storyline 1 Grade 8 – Activity 1 Resource 1: Sandcastle Poster

A comprehensive menu of CTAS materials are available on the Connecticut Comprehensive Assessment Program Portal.

Student Score Worksheet

Grade-specific student score worksheets are completed in hardcopy as the teacher administers the Performance Tasks (see Figure 6). As an option, teachers can take notes relevant to student performance or observations associated with each of the activities within a Performance Task. This information can be shared with the team of educators working with the student or can provide useful information when discussing performance with the child's parent or guardian.

Upon completing all Performance Tasks, the teacher submits the student responses for scoring through the Data Entry Interface (DEI) before the last day of the testing window.

Figure 6: Sample Grade 8 Student Score Worksheet Pages 1 and 2

Connecticut Alternate Science Assessment
Student Score Worksheet
Grade 8 Performance Tasks

Student Name:	**Trained TEA Name:**	
State Assigned Student Identifier (SASID):	**Trained TEA EIN:**	
Grade:	**Start Date:**	**Completion Date:**

Directions:

As you administer each Grade 8 Performance Task and associated activities for each Storyline, use this worksheet to record the student's scores for each activity. Each activity aligns to a single core extension. **Scores recorded on this worksheet must be entered into the Data Entry Interface (DEI) by June 3, 2022 in order for the student's responses to be scored.**

Ratings are determined by administering each activity developed to elicit student responses demonstrating understanding of knowledge associated with each Core Extension. Each Core Extension is scored by the trained educator using a General Rating Scale of 0, 1 or 2. Content guidance is included for each activity for clarity. The General Rating Scale is included below in addition to extra guidance to help make decisions for the selection of student ratings.

The No Response option should **only** be selected for very few students who are not able to demonstrate an observable response in any way to the first Activity in the first Performance Task of the first Storyline that the TEA chooses to administer. If you believe that your student qualifies for the Early Stopping Rule (ESR) refer to the Connecticut Alternate Assessment System Early Stopping Rule Flowchart.

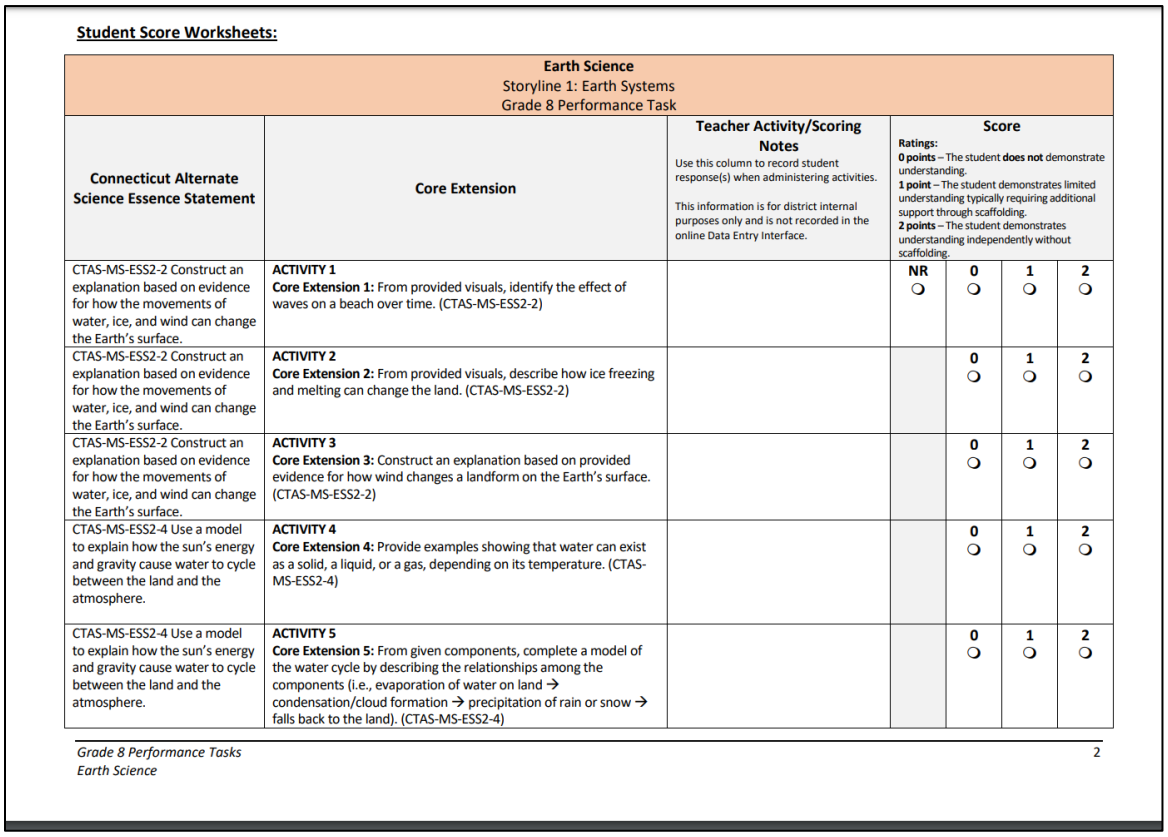
General Rating Scale:

0 points – The student **does not** demonstrate understanding.	1 point – The student demonstrates limited understanding typically requiring additional support through scaffolding.	2 points – The student demonstrates understanding independently without scaffolding.
Select this rating if a student requires Full Physical Guidance (physical assistance throughout an entire task) or if the student is not able to answer the question(s) in the activity correctly.	Select this rating if the student response was supported by the teacher using prompts or cues (any action that increases the probability that a student will complete a specific task). Prompts and cues are outlined in Figure 1.	Select this rating for student responses that clearly indicate the student has mastered the skill and performs independently. **Original directions may be repeated or rephrased without further explanation or clarification.**

Figure 1. Allowable Prompts and Cues

Prompt/Cue	Description	Example
Partial Physical Guidance	Partial physical assistance during the performance of some part of an activity.	Student requires some physical assistance in providing the correct answer without leading them to the correct choice.
Modeling	Teacher models/demonstrates a specific task or portion of an activity.	Trained TEA shows what action they want the student to perform without leading them to the correct choice.
Repetition(s) with a Cue	Original directions are repeated with the addition of a prompt/cue.	After giving direction such as "show me a plant" the teacher waits for response. If student does not respond, teacher repeats "show me a plant" and points to the array of answer options.

CTAS Sample Grade 8 Student Score Worksheet Page 2



Student Score Worksheets:

Earth Science Storyline 1: Earth Systems Grade 8 Performance Task						
Connecticut Alternate Science Essence Statement	**Core Extension**	**Teacher Activity/Scoring Notes** Use this column to record student response(s) when administering activities. This information is for district internal purposes only and is not recorded in the online Data Entry Interface.	**Score** **Ratings:** **0 points** – The student **does not** demonstrate understanding. **1 point** – The student demonstrates limited understanding typically requiring additional support through scaffolding. **2 points** – The student demonstrates understanding independently without scaffolding.			
CTAS-MS-ESS2-2 Construct an explanation based on evidence for how the movements of water, ice, and wind can change the Earth's surface.	**ACTIVITY 1** **Core Extension 1:** From provided visuals, identify the effect of waves on a beach over time. (CTAS-MS-ESS2-2)		**NR** ❍	**0** ❍	**1** ❍	**2** ❍
CTAS-MS-ESS2-2 Construct an explanation based on evidence for how the movements of water, ice, and wind can change the Earth's surface.	**ACTIVITY 2** **Core Extension 2:** From provided visuals, describe how ice freezing and melting can change the land. (CTAS-MS-ESS2-2)			**0** ❍	**1** ❍	**2** ❍
CTAS-MS-ESS2-2 Construct an explanation based on evidence for how the movements of water, ice, and wind can change the Earth's surface.	**ACTIVITY 3** **Core Extension 3:** Construct an explanation based on provided evidence for how wind changes a landform on the Earth's surface. (CTAS-MS-ESS2-2)			**0** ❍	**1** ❍	**2** ❍
CTAS-MS-ESS2-4 Use a model to explain how the sun's energy and gravity cause water to cycle between the land and the atmosphere.	**ACTIVITY 4** **Core Extension 4:** Provide examples showing that water can exist as a solid, a liquid, or a gas, depending on its temperature. (CTAS-MS-ESS2-4)			**0** ❍	**1** ❍	**2** ❍
CTAS-MS-ESS2-4 Use a model to explain how the sun's energy and gravity cause water to cycle between the land and the atmosphere.	**ACTIVITY 5** **Core Extension 5:** From given components, complete a model of the water cycle by describing the relationships among the components (i.e., evaporation of water on land → condensation/cloud formation → precipitation of rain or snow → falls back to the land). (CTAS-MS-ESS2-4)			**0** ❍	**1** ❍	**2** ❍

Grade 8 Performance Tasks
Earth Science
2

Scoring

Each student who takes the CTAS receives a total raw score on the raw score range (see Table 2) that corresponds to one of four performance levels, also known as achievement levels (see Table 3) The raw scores are the basic unit of reporting. The raw score is the accumulation of raw points achieved based on the rating for each activity in each performance task.

Table 2: CTAS Performance-Level Raw Score Ranges

Alternate Science Assessment (CTAS) Performance Level	Grade 5	Grade 8	Grade 11
Level 4	65–88	64–84	65–84
Level 3	57–64	57–63	57–64
Level 2	32–56	26–56	32–56
Level 1	0–31	0–25	0–31

Table 3: Achievement-Level Descriptors for CTAS

Level 1	**Does Not Meet the Alternate Achievement Standard:** The student has not yet met the alternate achievement standard for science expected for this grade. Students performing at this level require substantial improvement with continued support toward mastery of science knowledge and skills. Students performing at this level will likely need substantial supports to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.
Level 2	**Approaching the Alternate Achievement Standard:** The student has nearly met the alternate achievement standard for science expected for this grade. Students performing at this level require further development toward mastery of science knowledge and skills. Students performing at this level will likely need continued support to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.
Level 3	**Meets the Alternate Achievement Standard:** The student has met the alternate achievement standard for science expected for this grade. Students performing at this level are demonstrating progress toward mastery of science knowledge and skills. Students performing at this level are demonstrating understanding of grade-level science skills and knowledge represented in the alternate assessment.
Level 4	**Exceeds the Alternate Achievement Standard:** The student has exceeded the alternate achievement standard for science expected for this grade. Students performing at this level are demonstrating advanced progress toward mastery of science knowledge and skills represented in the alternate assessment.

CTAS Score Reporting

Overview

This section of the guide describes the various types of score reports provided for the Connecticut Alternate Science Assessment for the 2020-21 test administration. The information in the sample CTAS Individual Student Report (Appendix A) provided does not reflect the performance of any specific student.

Users of score report results should remember that test results are a single source of information about a student that should be used in conjunction with other relevant information on student performance (e.g., IEP progress reports and report cards).

Key features of the CTAS score report include:

- *Achievement Levels*. As described, Achievement-Level Descriptors (ALDs) or Performance Level Descriptors define the knowledge and skills that students demonstrate at four achievement levels. Given that characterizing a student's achievement solely in terms of falling in one of four categories is an oversimplification, achievement levels for CTAS serve as a starting point for discussion about the performance of a student based on the

alternate achievement standards expected for the tested grade (see Table 3). The ALDs do not equate directly to expectations for "on-grade" performance; rather, they represent differing levels of performance for a tested student within a grade level.

- *Raw Scores*. Each student's performance is reported using a raw score. This score provides more specific information about the student's achievement in each content area.
- *Descriptive Reports*. In addition to reporting student demographic information, performance level, and raw scores, the Individual Student Report (ISR) contains information about student performance and what the CTAS measures.

Achievement Levels or Performance Levels

The achievement-level ranges for the CTAS Assessments, guided by Connecticut educators, were established based on a standard-setting process conducted on July 29 and 30, 2019. This standard-setting process utilized Connecticut student assessment data from the first operational administration of the test in the spring of 2019. The process was facilitated by the psychometric teams from the CSDE, as well as the CSDE's testing vendor. The raw score ranges for each achievement level are reported in Table 2.

CTAS Individual Student Report – Paper Report

The paper version of the Individual Student Report (ISR) provides a summary of the student's performance on the CTAS. Two paper copies of CTAS ISRs are shipped to the local school districts. One copy is provided to parents or guardians and the other is retained by the district for the student's cumulative record. A sample ISR for grade 8 is provided in Appendix A.

On Page 1 of the ISR, an overview of the CTAS is provided, followed by the student's total raw score along with a table indicating the corresponding achievement level. A brief description of that performance level is shown below the table. Information is also provided about the student's performance on three areas of science knowledge and skills: Earth Science, Life Science, and Physical Science.

A raw score for the student's performance on each of the six performance tasks is also shown.

On Page 2 of the ISR, more detailed results (raw score out of a total number of points) are shown for each of the essence statements associated the six performance tasks.

Given the range of student abilities, a small subset of this population may not demonstrate a mode of communication and may not be able to respond to the Performance Tasks administered, even with the use of assistive technology and adaptive materials. When this situation arises, teachers follow prescribed measures outlined by the Connecticut State Department of Education called the Early Stopping Rule (ESR). These procedures allow for a teacher to attempt the administration of a Performance Task and pause when the student is unable to communicate a response to any portion of the activities within the Performance Task. Students count as testing participants but do not continue with testing once it is established by the teacher and the CSDE that a student qualifies. The teacher will complete the "NR" option associated with the attempted Performance Tasks on the Student Score Worksheet and then submit the response through the Data Entry Interface for reporting. Students unable to complete the assessment based on the criteria of the Early Stopping Rule are assigned to Performance Level 1.

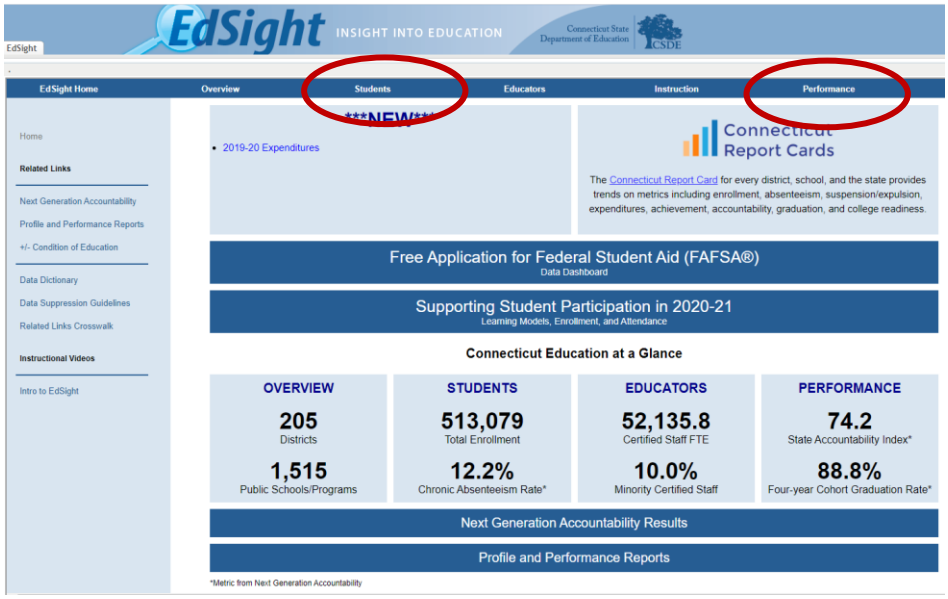
Accessing CTAS Results

CTAS Results Online

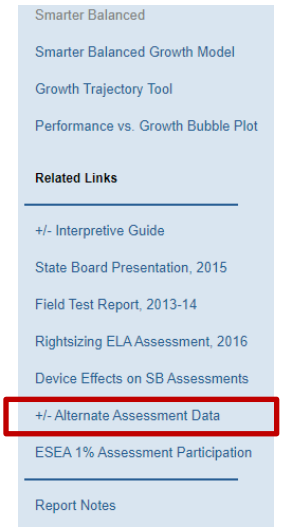
Non-confidential assessment results are publicly reported through EdSight. This is an interactive web site that integrates important school and district information collected by the Connecticut State Department of Education (CSDE) that serves as a single source for all data-driven analysis and reporting. The CTAS results, along with the CTAA results, can be accessed via any of these paths:

- through the Students link by selecting the *Students with Disabilities* page;
- under the Performance link by selecting *SAT/AP/PSAT* from the *Performance* drop-down menu. Information appears for download; or
- under the Performance link by selecting *Smarter Balanced* from the *Performance* drop-down menu. Information appears for download.

When viewing information on any of the above mentioned paths, generated results within a spreadsheet may be exported for review.



On any of the pages chosen under the Student or Performance options, choose the *+/- Alternate Assessment Data* link on the left of the screen to access CTAS and CTAA results.



Confidential alternate assessment data is available to authorized school and district personnel using two different platforms. The EdSight Secure platform provides designated district-and school-level users secure access to reports, analysis tools, and data visualizations available at the individual student and sub-group level. Additionally, CTAS results for individual students are password protected and available to authorized school district personnel in the score reports feature of the Centralized Reporting System (CRS), located on the Connecticut Comprehensive Assessment Program Portal.

The CRS is a web-based system that provides school district users access to individual student performance results. The Centralized Reporting System User Guide describes features of the CRS, including an overview of the available score reports, and is available on the Connecticut Comprehensive Assessment Program Portal.

Additional information about the alternate assessments, including the Connecticut Alternate Science Assessment are available through the Student Assessment link on the CSDE web site and on the CSDE Comprehensive Assessment Program Portal.

General questions about the CTAS should be directed to the Performance Office, at 860-713-6860 or CTStudentAssessment@ct.gov. Specific questions about individual student results should be directed to local school personnel.

Public Summary Data

Summary district and school reports for the CTAS and the CTAA are generated for each district and school and may be accessed by following this link to the Students with Disabilities page. Reports can be exported for viewing.

The Smarter Balanced page in EdSight is another route for accessing summary district and school reports for the CTAS and the CTAA for each district and school. Choose the *+/- Alternate Assessment Data* link on the left of the screen to access CTAS and CTAA results.

Secure Student-Level Data

Confidential student-level data is available for viewing and download through the CRS and EdSight Secure to users with the appropriate permissions.

Individual Student Reports

The Individual Student Report (ISR) provides raw score and performance-level information for a specific student. A full sample each ISR is included in Appendix A.

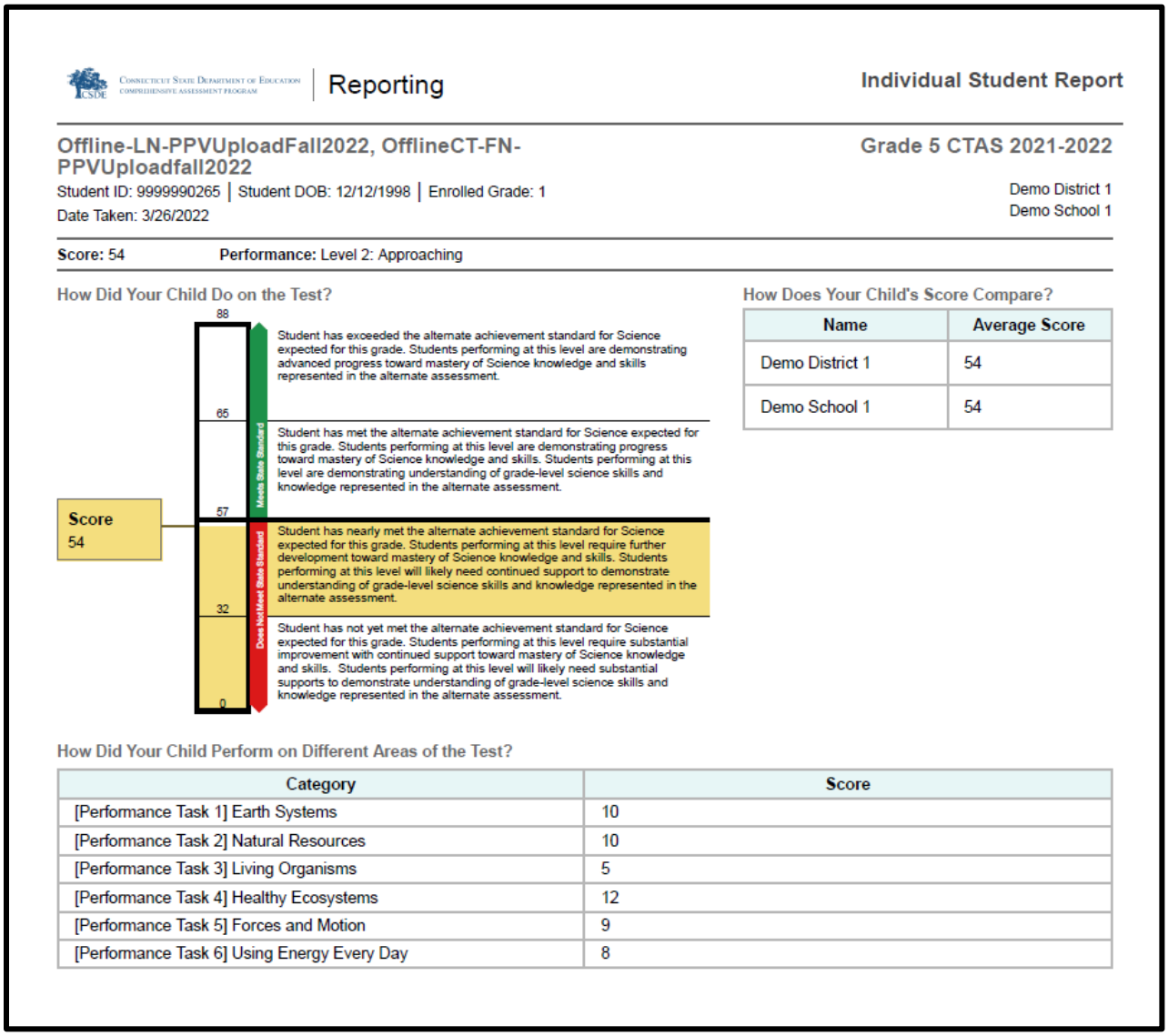
Two copies of each ISR are mailed to each district. One copy of the ISR must be provided to the parent/guardian and the second copy of the ISR is retained for the student's file. It is suggested that districts who have students placed in Approved Private Special Education Programs provide a courtesy copy of the appropriate Individual Student Reports to these programs.

All CTAS score reports are confidential documents.

Appendix A: CTAS Individual Student Reports

Sample Individual Student Report

The t Individual Student Report provides raw score and achievement-level information for a specific student.



Connecticut State Department of Education
Comprehensive Assessment Program

Reporting

Individual Student Report

Offline-LN-PPVUploadFall2022, OfflineCT-FN-PPVUploadfall2022

Student ID: 9999990265 | Student DOB: 12/12/1998 | Enrolled Grade: 1

Date Taken: 3/26/2022

Grade 5 CTAS 2021-2022

Demo District 1
Demo School 1

Score: 54 **Performance:** Level 2: Approaching

How Did Your Child Do on the Test?

88

Student has exceeded the alternate achievement standard for Science expected for this grade. Students performing at this level are demonstrating advanced progress toward mastery of Science knowledge and skills represented in the alternate assessment.

65

Meets State Standard

Student has met the alternate achievement standard for Science expected for this grade. Students performing at this level are demonstrating progress toward mastery of Science knowledge and skills. Students performing at this level are demonstrating understanding of grade-level science skills and knowledge represented in the alternate assessment.

57

Score
54

Does Not Meet State Standard

Student has nearly met the alternate achievement standard for Science expected for this grade. Students performing at this level require further development toward mastery of Science knowledge and skills. Students performing at this level will likely need continued support to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.

32

Student has not yet met the alternate achievement standard for Science expected for this grade. Students performing at this level require substantial improvement with continued support toward mastery of Science knowledge and skills. Students performing at this level will likely need substantial supports to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.

0

How Does Your Child's Score Compare?

Name	Average Score
Demo District 1	54
Demo School 1	54

How Did Your Child Perform on Different Areas of the Test?

Category	Score
[Performance Task 1] Earth Systems	10
[Performance Task 2] Natural Resources	10
[Performance Task 3] Living Organisms	5
[Performance Task 4] Healthy Ecosystems	12
[Performance Task 5] Forces and Motion	9
[Performance Task 6] Using Energy Every Day	8

Connecticut State Department of Education | Comprehensive Assessment Program | Reporting

Individual Student Report

Offline-LN-PPVUploadFall2022, OfflineCT-FN-PPVUploadfall2022

Grade 5 CTAS 2021-2022

Student ID: 9999990265 | Student DOB: 12/12/1998 | Enrolled Grade: 1
Date Taken: 3/26/2022

Demo District 1
Demo School 1

Score: 54 **Performance:** Level 2: Approaching

How Did Your Child Perform on Each Test Question?

[Performance Task 1] Earth Systems		
Question #	**Core Extension**	**Points Earned/Points Possible**
2	Identify key components that describe local weather conditions (e.g., temperature, amount of cloud cover, precipitation, and wind speed).	0/2
3	From provided temperature and precipitation data, identify the likely seasons.	1/2
4	From provided data, compare weather conditions between two specific time periods.	2/2
5	Using provided information, describe the climate in Connecticut.	1/2
6	From provided data (average temperature and precipitation), compare climates in two regions of the United States (e.g., northeast vs. southwest).	1/2
7	From provided information about the climate pattern in a region, make a prediction about typical weather conditions in that region.	1/2
8	Complete a model to describe changes in the shape of a land form due to wind and water.	2/2
9	From provided information, compare the effects of severe weather (e.g., drought, flooding, or hurricane) on land and living organisms.	2/2

[Performance Task 2] Natural Resources		
Question #	**Core Extension**	**Points Earned/Points Possible**
10	Distinguish between fresh and salt water and which is needed by humans and other organisms for survival.	1/2
11	Locate sources of freshwater (a lake and river) and saltwater (ocean) shown on a map.	1/2
12	From a simple graphic, compare the relative amounts of fresh and salt water in various reservoirs.	2/2
13	Describe two ways that humans use energy sources (e.g., generate electricity, heat homes, power a car).	1/2
14	Complete a causal chain explaining two ways that non-renewable energy sources (coal, oil, natural gas) affect the environment.	2/2
15	Complete a causal chain explaining two ways that renewable energy sources (wind, water, solar) affect the environment.	1/2
16	From provided information, identify a human activity that affects Earth's natural resources.	1/2
17	From provided information, identify a way to protect Earth's natural resources.	0/2
18	Given a scenario and background information, describe one positive and one negative effect of how a group of people can help to protect their community's natural resources.	1/2

[Performance Task 3] Living Organisms		
Question #	**Core Extension**	**Points Earned/Points Possible**
19	Identify a structure (part) of a plant or an animal that supports survival.	0/2
20	Match one structure (part) of a plant or an animal to its function (e.g., wings help a bird to fly).	1/2
21	Identify key stages (i.e., birth, growth, reproduction, death) of a plant or animal's life cycle.	2/2
22	Compare and contrast the life cycles of two plants or two animals to identify one similarity and one difference.	2/2
23	Make a claim about a structure that supports the survival or growth of a plant or an animal (e.g., stem of a plant transports water or food/nutrients to the plant; water and nutrients/food allow plant to survive; stem is thick on a sunflower; thick stem allows sunflower to grow tall).	0/2

Connecticut State Department of Education
Comprehensive Assessment Program

Reporting

Individual Student Report

Offline-LN-PPVUploadFall2022, OfflineCT-FN-PPVUploadfall2022

Grade 5 CTAS 2021-2022

Student ID: 9999990265 | Student DOB: 12/12/1998 | Enrolled Grade: 1
Date Taken: 3/26/2022

Demo District 1
Demo School 1

Score: 54 **Performance:** Level 2: Approaching

How Did Your Child Perform on Each Test Question?

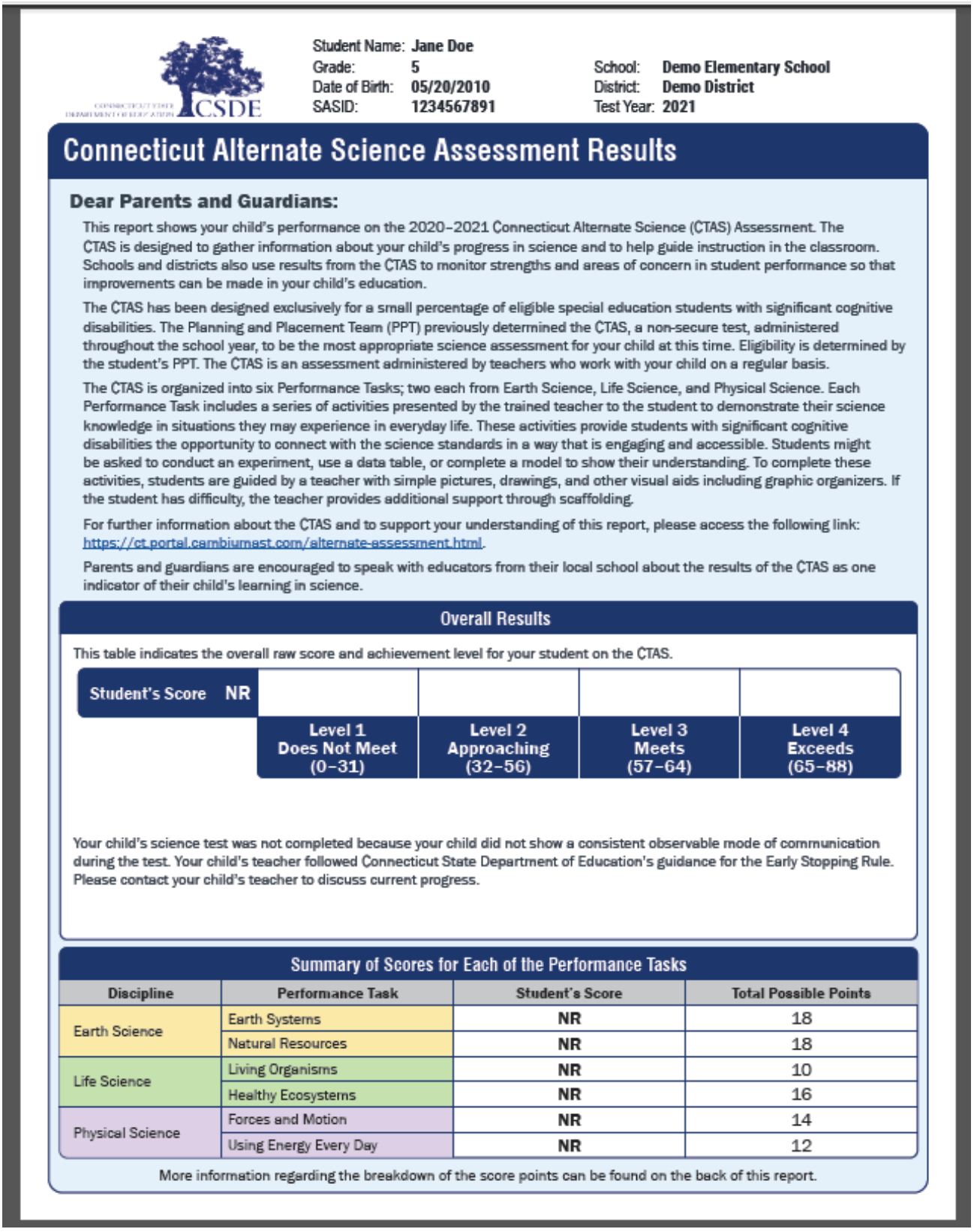
[Performance Task 4] Healthy Ecosystems		
Question #	**Core Extension**	**Points Earned/Points Possible**
24	Given several examples, identify which are plants and which are animals.	0/2
25	Identify two traits that help an organism survive in a given habitat.	1/2
26	Make and support a claim why some animals would not survive in a given habitat.	2/2
27	Describe the role of plants as producers and animals as consumers in the environment.	2/2
28	Use a simple food chain as a model to show the interactions of plants and animals in cycling matter.	2/2
29	Make a claim using evidence about two factors affecting the survival of an organism in a given habitat.	1/2
30	When given an environmental problem, identify a way to help reduce the harmful effects on plants or animals.	2/2
31	From two possible solutions, compare them and select one that may prevent environmental problems that affect plants or animals.	2/2

[Performance Task 5] Forces and Motion		
Question #	**Core Extension**	**Points Earned/Points Possible**
32	Identify a force as a push or pull on an object.	0/2
33	Recognize that an unbalanced force can cause an object to move.	1/2
34	Recognize that balanced forces do not cause an object to move or change motion.	1/2
35	Use the results of an investigation as evidence that two or more unbalanced forces will cause an object to move.	2/2
36	Make one qualitative observation about the pattern of an object in motion.	2/2
37	Make two quantitative observations to show the pattern of the motion of an object.	2/2
38	Make a prediction about the effect of a change in one variable on the motion of an object.	1/2

[Performance Task 6] Using Energy Every Day		
Question #	**Core Extension**	**Points Earned/Points Possible**
39	Distinguish between at least two examples of hot and cold.	0/2
40	Distinguish between at least two examples of light and dark.	1/2
41	Identify two examples of how light and heat energy are used in everyday life.	2/2
42	Make observations that heat is transferred from the sun to the Earth.	2/2
43	Use a simple model to show that plants need light energy from the sun to grow.	1/2
44	Use a simple model to describe that the food animals need was once energy from the sun.	2/2

Student Report with Early Stopping Rule Applied

Student's participating in the CTAS who do not show a consistent mode of communication and qualify for the Early Stopping Rule receive the following two page Individual Student Report.



CSDE

Student Name: **Jane Doe**
Grade: **5**
Date of Birth: **05/20/2010**
SASID: **1234567891**

School: **Demo Elementary School**
District: **Demo District**
Test Year: **2021**

Connecticut Alternate Science Assessment Results

Dear Parents and Guardians:

This report shows your child's performance on the 2020–2021 Connecticut Alternate Science (CTAS) Assessment. The CTAS is designed to gather information about your child's progress in science and to help guide instruction in the classroom. Schools and districts also use results from the CTAS to monitor strengths and areas of concern in student performance so that improvements can be made in your child's education.

The CTAS has been designed exclusively for a small percentage of eligible special education students with significant cognitive disabilities. The Planning and Placement Team (PPT) previously determined the CTAS, a non-secure test, administered throughout the school year, to be the most appropriate science assessment for your child at this time. Eligibility is determined by the student's PPT. The CTAS is an assessment administered by teachers who work with your child on a regular basis.

The CTAS is organized into six Performance Tasks; two each from Earth Science, Life Science, and Physical Science. Each Performance Task includes a series of activities presented by the trained teacher to the student to demonstrate their science knowledge in situations they may experience in everyday life. These activities provide students with significant cognitive disabilities the opportunity to connect with the science standards in a way that is engaging and accessible. Students might be asked to conduct an experiment, use a data table, or complete a model to show their understanding. To complete these activities, students are guided by a teacher with simple pictures, drawings, and other visual aids including graphic organizers. If the student has difficulty, the teacher provides additional support through scaffolding.

For further information about the CTAS and to support your understanding of this report, please access the following link: https://ct.portal.cambiumast.com/alternate-assessment.html.

Parents and guardians are encouraged to speak with educators from their local school about the results of the CTAS as one indicator of their child's learning in science.

Overall Results

This table indicates the overall raw score and achievement level for your student on the CTAS.

Student's Score NR				
	Level 1 Does Not Meet (0–31)	Level 2 Approaching (32–56)	Level 3 Meets (57–64)	Level 4 Exceeds (65–88)

Your child's science test was not completed because your child did not show a consistent observable mode of communication during the test. Your child's teacher followed Connecticut State Department of Education's guidance for the Early Stopping Rule. Please contact your child's teacher to discuss current progress.

Summary of Scores for Each of the Performance Tasks

Discipline	Performance Task	Student's Score	Total Possible Points
Earth Science	Earth Systems	NR	18
	Natural Resources	NR	18
Life Science	Living Organisms	NR	10
	Healthy Ecosystems	NR	16
Physical Science	Forces and Motion	NR	14
	Using Energy Every Day	NR	12

More information regarding the breakdown of the score points can be found on the back of this report.

Connecticut Alternate Science Assessment Results

Detailed Results

In addition to a total score for each Performance Task, results for each essence statement are reported (raw score out of the total points).

Performance Task 1: Earth Systems	
Guiding Questions: How does the weather change in different seasons? What types of climates are there and how can they be described? How do wind and water help to shape the land?	**Score: NR out of 18 Points**
Use and interpret data in tables and graphs to describe typical weather conditions expected during a particular season. CTAS-3-ESS2-1	**NR out of 8 Points**
Use information to describe climates in different regions of the United States. CTAS-3-ESS2-2	**NR out of 6 Points**
Use a model to show how wind and water interact with land and living organisms. CTAS-5-ESS2-1	**NR out of 4 Points**

Performance Task 2: Natural Resources	
Guiding Questions: From where do we get energy? From where do we get fresh water? How do we protect our natural resources?	**Score: NR out of 18 Points**
Interpret data to compare the relative amounts of fresh and salt water on Earth, and use maps to show their locations in various reservoirs (lakes, rivers, and oceans). CTAS-5-ESS2-2	**NR out of 6 Points**
Use information to describe renewable (wind, water, and solar) and non-renewable (coal, oil, and natural gas) sources of energy and how their uses affect the environment. CTAS-4-ESS3-1	**NR out of 6 Points**
Use information from multiple sources to describe ways people can protect our natural resources (water, air, land). CTAS-5-ESS3-1	**NR out of 6 Points**

Performance Task 3: Living Organisms	
Guiding Questions: What features do plants and animals have that allow them to survive? What life stages do living things go through over time?	**Score: NR out of 10 Points**
Make and support a claim that plants and animals have structures that function to support survival, growth, and behavior. CTAS-4-LS1-1	**NR out of 6 Points**
Compare simple models to describe the similarities and differences in the life cycle stages (birth, growth, reproduction, and death) of common organisms. CTAS-3-LS1-1	**NR out of 4 Points**

Performance Task 4: Healthy Ecosystems	
Guiding Questions: Where do plants and animals get the matter they need to survive? What causes organisms to thrive or not thrive in an ecosystem? How can humans contribute to a healthier environment?	**Score: NR out of 16 Points**
Make and support a claim that in a given habitat, some organisms can survive well, some survive less well, and some cannot survive at all. CTAS-3-LS4-3	**NR out of 6 Points**
Given evidence, compare possible solutions to a problem that causes changes in an environment affecting the plants and animals that live there.* CTAS-3-LS4-4	**NR out of 4 Points**
Use a simple model to describe the movement of matter among plants and animals in the environment. CTAS-5-LS2-1	**NR out of 6 Points**

Performance Task 5: Forces and Motion	
Guiding Questions: What makes objects move? How can the pattern of an object's motion be described?	**Score: NR out of 14 Points**
Use the results of an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. CTAS-3-PS2-1	**NR out of 8 Points**
Make observations and/or measurements to show the pattern of an object's motion in order to make predictions. CTAS-3-PS2-2	**NR out of 6 Points**

Performance Task 6: Using Energy Every Day	
Guiding Questions: What is energy and how is it transferred? How do we use light and heat energy? Where do we get the energy we need for everyday life?	**Score: NR out of 12 Points**
Make observations that light and heat are forms of energy that can be transferred from place to place. CTAS-4-PS3-2	**NR out of 8 Points**
Use a simple model to describe that light energy comes from the sun, and is used by plants to grow and produce food that is eaten by animals and/or humans that they use for various purposes. CTAS-5-PS3-1	**NR out of 4 Points**

*Indicates a Next Generation Science Standards (NGSS) Standard Performance Expectation or Connecticut Alternate Science Essence Statement that incorporates engineering design.

Appendix B: CTAS Performance Literals

CTAS Performance Literals for Grade 5

Level 1

[Student's first name] has not yet met the alternate achievement standard for Science expected for this grade. Students performing at this level require substantial improvement with continued support toward mastery of Science knowledge and skills. Students performing at this level will likely need substantial supports to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.

Level 2

[Student's first name] has nearly met the alternate achievement standard for Science expected for this grade. Students performing at this level require further development toward mastery of Science knowledge and skills. Students performing at this level will likely need continued support to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.

Level 3

[Student's first name] has met the alternate achievement standard for Science expected for this grade. Students performing at this level are demonstrating progress toward mastery of Science knowledge and skills. Students performing at this level are demonstrating understanding of grade-level science skills and knowledge represented in the alternate assessment.

Level 4

[Student's first name] has exceeded the alternate achievement standard for Science expected for this grade. Students performing at this level are demonstrating advanced progress toward mastery of Science knowledge and skills represented in the alternate assessment. .

CTAS Performance Literals for Grade 8

Level 1

[Student's first name] has not yet met the alternate achievement standard for Science expected for this grade. Students performing at this level require substantial improvement with continued support toward mastery of Science knowledge and skills. Students performing at this level will likely need substantial supports to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.

Level 2

[Student's first name] has nearly met the alternate achievement standard for Science expected for this grade. Students performing at this level require further development toward mastery of Science knowledge and skills. Students performing at this level will likely need continued support to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.

Level 3

[Student's first name] has met the alternate achievement standard for Science expected for this grade. Students performing at this level are demonstrating progress toward mastery of Science knowledge and skills. Students performing at this level are demonstrating understanding of grade-level science skills and knowledge represented in the alternate assessment.

Level 4

[Student's first name] has exceeded the alternate achievement standard for Science expected for this grade. Students performing at this level are demonstrating advanced progress toward mastery of Science knowledge and skills represented in the alternate assessment. .

CTAS Performance Literals Grade 11

Level 1

[Student's first name] has not yet met the alternate achievement standard for Science expected for this grade. Students performing at this level require substantial improvement with continued support toward mastery of Science knowledge and skills. Students performing at this level will likely need substantial supports to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.

Level 2

[Student's first name] has nearly met the alternate achievement standard for Science expected for this grade. Students performing at this level require further development toward mastery of Science knowledge and skills. Students performing at this level will likely need continued support to demonstrate understanding of grade-level science skills and knowledge represented in the alternate assessment.

Level 3

[Student's first name] has met the alternate achievement standard for Science expected for this grade. Students performing at this level are demonstrating progress toward mastery of Science knowledge and skills. Students performing at this level are demonstrating understanding of grade-level science skills and knowledge represented in the alternate assessment.

Level 4

[Student's first name] has exceeded the alternate achievement standard for Science expected for this grade. Students performing at this level are demonstrating advanced progress toward mastery of Science knowledge and skills represented in the alternate assessment. .

Appendix C: CTAS Performance-Level Descriptors

Grade 5 CTAS Performance-Level Descriptors

Domain/ Storyline Grade 5	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Earth Science Storyline 1: Earth Systems	3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	CTAS-3-ESS2-1 Use and interpret data in tables and graphs to describe typical weather conditions expected during a particular season.	Identify two forms of water (e.g., rain, snow, hail, sleet) that can fall from clouds to Earth.	Identify key components that describe local weather conditions (e.g., temperature, amount of cloud cover, precipitation, and wind speed).	From provided temperature and precipitation data, identify the likely seasons.	From provided data, compare weather conditions between two specific time periods.
Earth Science Storyline 1: Earth Systems	3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.	Use information to describe climates in different regions of the United States.	Identify a climate (e.g., cold and wet, hot and dry).	Using provided information, describe the climate in Connecticut.	From provided data (average temperature and precipitation), compare climates in two regions of the United States (e.g., northeast vs. southwest).	From provided information about the climate pattern in a region, make a prediction about typical weather conditions in that region.
Earth Science Storyline 1: Earth Systems	5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	Use a model to show how wind and water interact with land and living organisms.	Recognize that landforms change (e.g., shoreline changes; brook/stream changes).	Recognize that water or wind can change a landform (e.g., erosion from flooding changes the shape of a brook; waves change the shoreline).	Complete a model to describe changes in the shape of a land form due to wind and water.	From provided information, compare the effects of severe weather (e.g., drought, flooding, hurricane) on land and living organisms.
Earth Science Storyline 2: Natural Resources	5-ESS2-2 Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	Interpret data to compare the relative amounts of fresh water and salt water on Earth, and use maps to show their locations in various reservoirs (lakes, rivers, and oceans).	Recognize there are different kinds of water (fresh water and salt water).	Distinguish between fresh water and salt water and which is needed by humans and other organisms for survival.	Locate sources of freshwater (a lake and a river) and saltwater (ocean) shown on a map. From a simple graphic, compare the relative amounts of fresh and salt water in various reservoirs.	Provide evidence to support the need for fresh water.

Domain/ Storyline Grade 5	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Earth Science Storyline 2: Natural Resources	4-ESS3-1 Obtain and combine information to describe that energy and fuel are derived from natural resources and their uses affect the environment.	Use information to describe renewable (wind, water, and solar) and non-renewable (coal, oil, and natural gas) sources of energy and how their uses affect the environment.	Identify an energy source (sun, wind, moving water, fossil fuel).	Describe two ways that humans use energy sources (e.g., generate electricity, heat homes, power a car).	Complete a causal chain explaining two ways that renewable (wind, moving water, solar) or nonrenewable energy sources (coal, oil, natural gas) affect the environment.	Use sources of information to describe two ways that human energy use impacts the environment.
Earth Science Storyline 2: Natural Resources	5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect Earth's resources and environment.	Use information from multiple sources to describe ways people can protect our natural resources (water, air, land).	Identify a human activity that uses natural resources (e.g., washing dishes).	From provided information, identify a human activity that affects Earth's natural resources.	From provided information, identify a way to protect Earth's natural resources.	Given a scenario and background information, describe one positive and one negative effect of how a group of people can help to protect their community's natural resources.
Life Science Storyline 3: Living Organisms	4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	Make and support a claim that plants and animals have structures that function to support survival, growth, and behavior.	Identify a structure (part) of a plant or an animal that supports survival.	Match one structure (part) of a plant or an animal to its function (e.g., wings help a bird to fly).	Make a claim about a structure that supports the survival or growth of a plant or an animal (e.g., stem of a plant transports water or food/nutrients to the plant; water and nutrients/food allow plant to survive; stem is thick on a sunflower; thick stem allows sunflower to grow tall).	Describe the similarities or differences in the structures of two animals that serve the same function for survival, growth, or behavior.
Life Science Storyline 3: Living Organisms	3-LS1-1 Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	Compare simple models to describe the similarities and differences in the life cycle stages (birth, growth, reproduction, and death) of common organisms.	Recognize that living things grow and change.	Identify key stages (i.e., birth, growth, reproduction, death) of a plant's or animal's life cycle.	Compare and contrast the life cycles of two plants or two animals to identify one similarity and one difference.	Construct a model of the life cycle of another organism.

Domain/ Storyline Grade 5	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Life Science Storyline 4: Healthy Ecosystems	5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Use a simple model to describe the movement of matter among plants and animals in the environment.	Given several examples, identify which are plants and which are animals.	Describe the role of plants as producers and animals as consumers in the environment.	Use a simple food chain as a model to show the interactions of plants and animals in cycling matter.	Construct a simple food web to show the movement of matter among plants and animals in the environment.
Life Science Storyline 4: Healthy Ecosystems	3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.	Given evidence, compare possible solutions to a problem that causes changes in an environment affecting the plants and animals that live there.	Identify a harmful effect on an environment (pollution, flood).	When given an environmental problem, identify a way to help reduce the harmful effects on plants or animals.	From two possible solutions, compare them and select one that may prevent environmental problems that affect plants or animals.	Describe a scenario with an environmental problem, then develop and support a solution.
Life Science Storyline 4: Healthy Ecosystems	3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	Make and support a claim that in a given habitat, some organisms can survive well, some survive less well, and some cannot survive at all.	Identify a trait of an organism.	Identify two traits that help an organism survive in a given habitat.	Make and support a claim about why some animals would not survive in a given habitat.	Make a claim using evidence about two factors affecting the survival of an organism in a given habitat.
Physical Science Storyline 5: Forces and Motion	3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	Use the results of an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	Identify a force as a push or pull on an object.	Determine that an unbalanced force can cause an object to move and that balanced forces do not cause an object to move or change motion).	Use the results of a multi-trial investigation as evidence that unbalanced forces will cause an object to move.	Predict the movement of an object when unbalanced forces are exerted on the object in an investigation.
Physical Science Storyline 5: Forces and Motion	3-PS2-2 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.	Make observations and/or measurements to show the pattern of an object's motion in order to make predictions.	Identify an object in motion.	Make a qualitative observation about the pattern of an object in motion.	Make quantitative observations to show the pattern of the motion of an object.	Make a prediction about the effect of a change in one variable on the motion of an object.

Domain/ Storyline Grade 5	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Physical Science Storyline 6: Using Energy Every Day	4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	Make observations that light and heat are forms of energy that can be transferred from place to place.	Distinguish between at least two examples of hot and cold and two example of light and dark.	Identify two examples of how light and heat energy are used in everyday life.	Make observations to provide evidence that heat is transferred from the sun to Earth.	Given an investigation, describe how the results show that light and heat were transferred.
Physical Science Storyline 6: Using Energy Every Day	5-PS3-1 Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	Use a simple model to describe that light energy comes from the sun, and is used by plants to grow and produce food that is eaten by animals and/or humans that they use for various purposes.	Identify that food changes into energy that animals use.	Use a simple model to show that plants need light energy from the sun to grow.	Use a simple model to describe that the food animals need was once energy from the sun.	Develop a model to describe that the food animals need was once energy from the sun.

Grade 8 CTAS Performance-Level Descriptors

Domain/ Storyline Grade 8	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Earth Science Storyline 1: Earth Systems	MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	Construct an explanation based on evidence for how the movements of water, ice, and wind can change Earth's surface.	Recognize that wind, water, or ice can change land (landforms) over time (e.g., wind can move a pile of sand).	From provided visuals, identify the effect of waves, ice, or wind on land over time.	Construct an explanation based on evidence about how wind, water, or ice can change a landform on Earth's surface.	Without scaffolding, construct an explanation about how wind, water, or ice change the land.
Earth Science Storyline 1: Earth Systems	MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	Use a model to explain how the sun's energy and gravity cause water to cycle between the land and the atmosphere.	Identify forms of water (e.g., ice – solid, water – liquid).	Provide examples showing that water can exist as a solid, a liquid, or a gas, depending on its temperature.	From given components, complete a model of the water cycle by describing the relationships among the components (i.e., evaporation of water on land, condensation/cloud formation, precipitation of rain or snow, falls back to the land).	Given a model of the water cycle, describe the effect that the sun's energy (heat) and Earth's gravity have on water.
Earth Science Storyline 1: Earth Systems	MS-ESS2-5 Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.	Use data to provide evidence of atmospheric conditions that result in precipitation.	Identify weather conditions (e.g., rain, snow, cloudy, sunny.).	Identify, with scaffolding, cloud types for sunny weather or stormy weather.	Based on the provided evidence, relate cloud types to associated weather.	When given a set of temperature data, make a connection between the temperature change and precipitation.
Earth Science Storyline 2: Natural Resources	MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.	Use evidence to explain that natural resources (fresh water, soil, fossil fuels) used by humans are often limited and not easily replaced by natural processes.	Identify a renewable resource (e.g., water, sunlight, wind).	Distinguish between renewable resources (e.g., sunlight, water, wind) and non-renewable resources (e.g., soil, fossil fuels).	Complete a causal chain (i.e., flow chart) to describe the formation of a non-renewable resource over time.	From provided evidence, compare the distribution of a renewable and a non-renewable resource.

Domain/ Storyline Grade 8	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Earth Science Storyline 2: Natural Resources	MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	Evaluate a method for minimizing human impact (e.g., waste production) on the environment.*	Recognize that some materials can be recycled.	Identify two ways that people can reduce the amount of waste they produce.	Identify one positive aspect (or one limitation) of recycling.	Given a scenario, compare two methods that may be used to reduce humans' waste impact on the environment.
Earth Science Storyline 2: Natural Resources	MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	Analyze data to provide evidence of the amount of water used by humans for everyday purposes.	Identify one way that people use water in everyday life (e.g., brushing teeth, taking a bath, cooking).	Identify two ways that people use water in everyday life (e.g., brushing teeth, taking a bath, cooking).	Based on provided data, compare the amount of water used in different activities.	Analyze water-use data to support a claim about the amount of water used by a growing population over time.
Life Science Storyline 3: Living Organisms	MS-LS1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	Use the results of an investigation as evidence that living things are made of different types of cells.	Identify a living thing.	Identify that living things are made of cells.	Identify that animals are made of animal cells.	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
Life Science Storyline 3: Living Organisms	MS-LS1-3 Make an argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	Make and support a claim based on evidence that the human body is made up of cells and tissues that form body systems.	Recognize that a human body system is made up of cells.	Identify the type of cells in the circulatory system.	Use evidence to show how two body systems work together to perform a function.	Make an argument supported by evidence that the human body is made up of cells and tissues that form body systems.
Life Science Storyline 3: Living Organisms	MS-LS1-4 Make an argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	Make and support a claim based on evidence for how animal behaviors and plant structures affect their ability to survive and reproduce.	Identify plant structures.	Determine how an animal's behavior helps the animal to survive (e.g., bears hibernate to survive in the winter).	Identify a structure in a plant that the plant uses to survive or reproduce (e.g., a cone falls from a tree to distribute seeds and allows another tree to grow).	Use provided evidence to make and support a claim for how a behavior of an animal or a structure of a plant helps them survive and reproduce.

Domain/ Storyline Grade 8	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Life Science Storyline 4: Healthy Ecosystems	MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	Interpret data to provide evidence for the effects of resource availability on populations of organisms in an ecosystem.	Identify resources in an ecosystem (e.g., food, water, shelter).	Identify two resources (e.g., food, water, shelter) that affect the size of a population in a given ecosystem.	Use data from a table or a graph to provide evidence of how the availability of a resource affects the size of a population.	Use data to explain how a change in the availability of a resource affects the population's size of organisms in an ecosystem.
Life Science Storyline 4: Healthy Ecosystems	MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	Evaluate a solution to maintaining a healthy ecosystem, including the physical environment and the plants and animals that live there.	Identify a nonliving feature in a given ecosystem.	Recognize the difference between physical (non-living) and living features in a given ecosystem.	Identify how two factors (one physical [non-living] and one living) may affect the plants and animals living in an ecosystem.	Evaluate a solution (by identifying one benefit and one drawback) to a problem in an ecosystem (e.g., lack of water, pollution, or an invasive species).
Life Science Storyline 4: Healthy Ecosystems	MS-LS4-6 Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	Use data to support an explanation for a change in the traits of animals and plants in a population over time.	Identify a trait of an organism.	In a given ecosystem, describe how one trait in a plant or an animal may affect the population over time.	Describe how a trait in a plant or animal population has changed over time from provided visual representations.	Use data from a table or graph to support an explanation of how a trait in a plant or animal population has changed over time.
Physical Science Storyline 5: Forces and Motion	MS-PS2-2 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	Use and evaluate the results of an investigation to provide evidence that the change in an object's motion depends on the forces acting on the object and the mass of the object.	Recognize the relative strength (e.g., stronger or weaker) of two different forces on an object.	Using equipment (e.g., a balance or scale), measure the mass of an object in grams.	Use the results of an investigation to support a claim about the effect of two (balanced or unbalanced) forces or the effect of mass on the motion of an object.	Identify the changing (independent) variable and one constant in the provided investigation.
Physical Science Storyline 6: Using Energy Every Day	MS-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	Test a device that either minimizes or maximizes heat energy transfer.	Identify that the appropriate tool to measure temperature is a thermometer.	Identify objects that minimize or maximize heat energy transfer.	When shown a visual representation of a fair test, select the item that shows the loss of heat energy minimized.	Suggest an improvement to a device to further minimize heat energy transfer.

Domain/ Storyline Grade 8	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Physical Science Storyline 6: Using Energy Every Day	MS-PS3-5: Construct, use and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from an object.	Make and support a claim about the transfer of energy (kinetic energy) between two objects.	Identify forms of energy (e.g., heat, sound).	When provided examples of energy being used, identify kinetic energy as energy of motion.	Support a claim using provided materials that kinetic energy can be changed into heat and/or sound energy.	Make and support a claim about the transfer of energy (kinetic energy) between two objects.

Grade 11 CTAS Performance-Level Descriptors

Domain/ Storyline Grade 11	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Earth Science Storyline 1: Earth Systems	HS-ESS2-4 Use a model to describe how variations in the flow of energy into and out of Earth's systems results in a change in climate.	Use a model to describe how the sun's energy and its distribution on Earth influence climate.	Identify that the sun gives off heat energy.	Using a model, describe the sun's warming effect on Earth (i.e., it is warmer in summer).	Use a model to describe the cause-and-effect relationship between the sun's energy and the climate in different areas on Earth (i.e., polar regions vs. regions near the equator).	Given a model, describe the cause-and-effect relationship between the amount of energy from the sun and how that affects climates and seasons on Earth.
Earth Science Storyline 1: Earth Systems	HS-ESS2-5 Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.	Use the results of an investigation to show the effects of flowing water (erosion) and freezing water (mechanical weathering) on Earth's surface.	Identify a change to Earth materials after water has flowed through.	From an erosion or weathering investigation, identify the variable that was changed on purpose (independent variable), a variable that was affected (dependent variable), and a variable that was held constant (e.g. stream table investigation).	Using the results of an erosion or weathering investigation, use data to draw a conclusion about how flowing water affects Earth materials.	Based on observations, make a claim about the relationship between water temperature and the physical change of an object (e.g., water freezing in cracks causes rocks to break into pieces or leads to potholes in roads).
Earth Science Storyline 2: Natural Resources	HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.	Construct an explanation based on evidence for how the availability of natural resources influences human activity.	From a picture, identify one natural resource (e.g., fresh water, land, fossil fuels) that affects human activity.	Complete a causal-chain (e.g., flow chart) explaining how the availability of a natural resource (e.g., fresh water, land, fossil fuels) may affect human activity.	Construct an explanation based on provided evidence (e.g., pictures) of how the availability of a natural resource (e.g., fresh water, land, fossil fuels) affects human activity.	Identify the evidence (data) that supports a cause-and-effect relationship between the availability of a natural resource (e.g., fresh water, land, fossil fuels) and human activity.
Earth Science Storyline 2: Natural Resources	HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.	Evaluate a technological solution (e.g., energy generated from water, wind, or the sun) that reduces impacts of human activities on the environment.	Identify a renewable energy source (e.g., hydroelectric power).	From a simple diagram, describe how electricity can be produced from flowing water (i.e., hydroelectric power).	Using a simple diagram, describe the impact of a change (e.g., increasing the amount of water that flows through a dam) in the design of a system used to generate electricity from flowing water.	From provided information, compare and/or contrast the use of two sources of electricity (e.g., hydroelectric power and fossil fuels).

Domain/ Storyline Grade 11	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Earth Science Storyline 2: Natural Resources	HS-ESS3-3 Create a computer simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.	Analyze data to show the relationship between the management of a natural resource and the population of organisms living in an environment.	Identify one effect on an ecosystem of building a dam to produce hydroelectric power.	Identify two possible effects on an ecosystem of building a dam to produce hydroelectric power.	Analyze population data to describe changes in the populations of organisms before and after a dam is built.	Analyze data to predict how a population would change after a dam is built.
Life Science Storyline 3: Living Organisms	HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	Use a model to show how the parts of a human organ system (e.g., nervous, muscular, circulatory, digestive, reproductive) and organ systems work together to perform functions.	Identify the basic function of one human organ system.	Identify the human body system or system component and the way that it supports the human body (e.g., identify the system or organ that supports breathing - lungs/respiratory system).	Use a model to show how two organ systems work together to perform a function.	From provided components, complete a simple model to show how the parts of a human organ system work together to perform a specific function.
Life Science Storyline 3: Living Organisms	HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	Use the results of an investigation as evidence that living systems respond to external change in order to maintain balance and survive.	Identify external changes that affect living systems.	Given an external change, identify the organism's response to the change that increases opportunities for survival (e.g., humans sweat to cool body when it is hot).	Use the results of an investigation to describe how a living system responds to an external change to maintain balance and survive.	Provided the results of an investigation, make a claim about the body's ability to maintain balance of a vital feature (i.e., temperature, heart rate, breathing rate) for survival.
Life Science Storyline 3: Living Organisms	HS-LS1-4 Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.	Use a model to show how cell changes (e.g., maintenance through division, differentiation, or multiplication) results in changes to the organism (e.g., growth, complexity).	Identify the relative sizes of given organisms.	Use a model to relate the number of cells to the size of an organism.	Use a model to show that as the complexity of an organism increases, so does the number, type, and specialization of cells.	Use a model to show cell division, differentiation, or multiplication.

Domain/ Storyline Grade 11	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Life Science Storyline 4: Healthy Ecosystems	HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect the carrying capacity of ecosystems at different scales.	Use data to explain the factors that affect the limits on plant and animal populations in an ecosystem.	Identify an organism's needs for survival in an environment (e.g., food, shelter).	Identify two factors that affect the limits on plant or animal populations in an ecosystem.	Use data to show how the population of a plant or animal changes if the availability of a resource changes.	Use data from a table or graph to explain how a factor limits a plant or animal population in an ecosystem.
Life Science Storyline 4: Healthy Ecosystems	HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	Evaluate a possible solution for reducing the impact of human activities on the environment, including plants and animals.	Identify a human activity that impacts the environment.	Describe two effects of a human activity on the environment.	Given a solution for reducing human impact on the environment, identify a positive and negative aspect.	Develop a solution to reduce the impact of human activities on the environment.
Life Science Storyline 4: Healthy Ecosystems	HS-LS2-8 Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.	Use evidence to show how group behaviors help animals survive and reproduce.	Identify a group behavior.	Recognize a group behavior (e.g., flocking, hunting in a pack) that helps animals survive.	Describe how a specific group behavior helps an organism to survive.	Given a scenario, use evidence to show how a group behavior helps plants or animals survive and reproduce.
Life Science Storyline 4: Healthy Ecosystems	HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations. HS-LS4-5 Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.	Use evidence to explain how natural selection leads to adaptation, growth, and/or possible extinction of populations of organisms and/or species.	Identify a trait that helps an organism survive in its environment.	Given several traits, identify one that varies and is passed on to offspring within a population of organisms.	Given an environmental change, determine which physical adaptation passed on to offspring would ensure the survival of a population.	Given a scenario, use a graph or table to identify a cause and effect relationship between natural selection and an adaptation.

Domain/ Storyline Grade 11	NGSS Standard Performance Expectation	Essence Statements	Level 1-Does Not Meet Expectations	Level 2-Approaching Expectations	Level 3-Meets Expectations	Level 4-Exceeds Expectations
Physical Science Storyline 5: Forces and Motion	HS-PS2-1 Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.	Use observations and/or data to support a claim that the net force on an object is equal to its mass multiplied by its acceleration.	Compare the speed of two objects under different conditions.	Compare the acceleration of objects (speeding up or slowing down) under different conditions.	Use observations to show that the greater the force applied to an object, results in a greater acceleration of the object.	Use observation and/or data to support a claim that a greater force will cause an object in motion to speed up faster.
Physical Science Storyline 5: Forces and Motion	HS-PS2-3 Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.	Test a device that minimizes the force on a common object during a collision. (CTAS-HS-PS2-3)	Identify a collision between two objects.	Identify ways to reduce the force during a collision.	Gather data to investigate the force on an object during a collision.	Make and support a claim about the modification to a device and its effect on reducing the force during the collision.
Physical Science Storyline 6: Using Energy Every Day	HS-PS3-3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.	Test a device that converts one form of energy into another form of energy in everyday life.	Identify two ways that different forms of energy (e.g., heat, motion, light, sound, electrical, mechanical, wind, kinetic) are used in everyday life.	Given examples of energy transformation, label the energy change from one form to another.	Use the results of a test to show that energy is transferred using a device.	Make and support a claim that one device converts energy more efficiently than another device.
Physical Science Storyline 6: Using Energy Every Day	HS-PS3-4 Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).	Use the results of an investigation as evidence that when objects at different temperatures are brought together in a system, they will eventually reach equilibrium (the same temperature).	Qualitatively describe the temperature of two samples (e.g., hotter vs. colder water).	Measure the temperature of water at two different temperatures.	Use the results of an investigation to show that temperature equilibrium will be reached by combining water at two different temperatures.	Design an investigation to test the temperature change in objects that are brought together with other objects of differing temperatures.