GUIDE TO **UNIVERSAL DESIGN FOR LEARNING** IN

AGRICULTURE

Cultivating Sustainability and Nourishing the World

CTE TECHNICAL ASSISTANCE CENTER OF NY

ABOUT THIS GUIDE

Universal Design for Learning (UDL) is a framework for designing learning experiences that are inclusive, accessible, and engaging for all students. UDL is not a checklist of required practices, but a mindset of continuous improvement. By increasing flexibility and options, UDL helps teachers proactively remove barriers, meet students where they are, and provide everyone with an equal opportunity to learn.

This document is part of a series that illustrates how UDL principles can be applied in each of Advance CTE's 14 career clusters. The series extends and tailors the tips provided in two prior publications, Supporting All Students in New York State CTE Programs [PDF] and Supporting Special Populations in New York State CTE Programs [PDF], available on the CTE TAC's website.

Photo: Herkimer BOCES

With its emphasis on relevant, authentic, hands-on learning, UDL is a natural fit for CTE classrooms!

5 REASONS WHY UDL WORKS FOR CTE AGRICULTURE

1. Agriculture combines theoretical knowledge with hands-on activities and practical applications. It offers **multiple modes of learning** and a variety of **authentic opportunities** for students to show what they know.
2. Agriculture involves **real-world issues** that affect us in our daily lives. We all depend on food, fuel, and fiber to survive.
3. Every culture and society has an agricultural tradition, making the field **relevant to diverse students**.
4. Agriculture **engages all of our senses**, providing a rich and immersive learning experience. UDL helps us ensure that sensory differences do not become barriers to participation.
5. Agriculture is the largest employer in the world, **spanning all employment sectors and numerous industries**. Through self-directed learning, UDL broadens the range of knowledge, skills, perspectives, and career paths students can explore.

QUICK REFERENCE GUIDE TO UDL FOR CTE

Universal Design is the process of creating objects, environments, and experiences that can be accessed, understood, and used to the greatest extent possible by people with a wide range of abilities, needs, and characteristics. Universal Design for Learning (UDL) applies the concept of Universal Design to learning contexts.

UNIVERSAL: UDL is a framework for **creating learning experiences that work for *everyone***. Proactively identifying and removing barriers to learning creates a more inclusive environment where all students have equitable opportunities to learn.

DESIGN: There is no one approach to learning that is optimal for every student in every situation. The UDL principles guide teachers to **plan for learner variability by offering flexibility and options**.

FOR LEARNING: Rather than a one-size-fits-all approach, **UDL empowers students to tailor the learning experience** for their individual needs, goals, and preferences. By discovering how they learn best, students develop into self-directed, resourceful, and skillful learners.

THE UDL PRINCIPLES*

	ENGAGEMENT	REPRESENTATION	ACTION & EXPRESSION
What is it?	The **WHY** of learning	The **WHAT** of learning	The **HOW** of learning
Why is it important?	Students differ in **what interests them** and **what motivates them to learn**.	Students differ in how they **perceive and make meaning from information**.	Students differ in how they **navigate learning environments and express what they know**.
What does it look like in practice?	Students engage in authentic, hands-on learning. Learning is relevant to students' identities, personal interests, and career goals. Students collaborate, co-create, and build community with peers. Students feel safe, included, and welcome. Fun and creativity are encouraged.	Course materials are accessible for all learners. Multiple media are used to present information. Language and symbols are clarified and decoded. The curriculum and course materials represent diverse individuals and perspectives. Learning is structured to help students build knowledge.	Learning activities and assessments are accessible for all learners. Students are guided to organize information, manage time, set goals, and plan their learning. Students communicate and express themselves in different ways. Students participate in class activities and demonstrate their learning in different ways.

** Abridged and adapted from the CAST UDL Guidelines.*

SAMPLE LESSON

Let's look at a sample lesson to see how the general principles described on page 2 can be applied in CTE Agriculture.

Examples abridged and adapted from the lesson "Apples and the Science of Genetic Selection" by Harley Braun, Sue Knott, and Keri Sidle (Minnesota Agriculture in the Classroom). Available online at: https://ctetac.us/aglesson

Key to abbreviations:
R = Representation, **A = Action & Expression**, **E = Engagement**

Photo: St. Lawrence-Lewis BOCES

ELEMENT	WHY DOES IT WORK?	GO FURTHER WITH UDL
Learning goal: Students will distinguish between natural and artificial selection by exploring how apples have been artificially selected for specific traits like color, texture, taste, and crispness.	Allows teachers to envision multiple ways students can achieve and demonstrate learning **(A)**.	Share the learning objectives for each lesson with students to **set expectations and short-term goals (A)**. Point out the academic, Common Career Technical Core, and cluster-specific industry standards addressed in the lesson to **illustrate the lesson's relevance** to students' career goals **(E)**.
Lesson-specific **vocabulary terms** *(e.g., artificial selection, clone, crossbreeding)* A brief written introduction ("Background Agricultural Connections") demonstrates how the terms are used in context	Supports comprehension and provides essential background knowledge **(R)**. Proactively addresses language barriers **(R)**.	Play a vocabulary quiz game to **activate students' prior knowledge (R)** and **make learning fun (E)**. **Support long-term recall** (e.g., student-created flashcards, low-stakes vocabulary quizzes) **(A)**. Show students how to break down the terms into prefixes, suffixes, and roots to **decode meaning (R)**.
Open-ended **"icebreaker" or "bell ringer"** questions, such as: • What types of apples have you tried? • What qualities make a good / poor apple? • How many varieties of apples do you think there are?	Curiosity promotes engagement and focuses attention **(E)**. Provides insight into students' prior knowledge and misconceptions to inform teaching **(R)**.	As an **alternative to oral participation**, invite students to submit a written response to a chosen prompt as a class "entry ticket" **(A)**. Offer discussion questions in a printed handout, on screen, or on the whiteboard as an **alternative format (R)** and **memory aid (A)**. Provide samples of different varieties of apples to **promote inclusion (E)** and **engage multiple senses (R)**.

ELEMENT	WHY DOES IT WORK?	GO FURTHER WITH UDL
Students rotate among stations in **small groups** to review various types of media content (text, videos, webpage).	Learning is enhanced when students perceive information in multiple ways **(R)**. Multiple media engage various learning styles and preferences **(E)**. Working in small groups supports collaborative learning **(E)**.	Choose **media and formats that are accessible** for students with disabilities and permit all learners to **customize the display of information (R)**. Invite students to **curate and share additional resources**, as a graded assignment, extra-credit opportunity, or class participation activity **(E)**.
Venn **diagram** guides students to classify characteristics of artificial and natural selection.	Graphic organizers support visual learners **(R)**. Helps students structure notes and provides a learning aid for later review and recall **(A)**.	Share the provided prompts to help students **identify patterns and big ideas** before they populate the diagram **(R)** or **brainstorm response options collaboratively** as a class **(A)**. Use a digital poll, word cloud, or other **visualization tool (R)** to **collect students' responses interactively (A)** and **share them with the class confidentially (E)**.
Closing: The **"Evaluate"** prompts review and summarize key ideas from the lesson.	Ensures students understand the "big picture" **(R)**. Closure helps students prepare to transition to their next class **(A)**.	Explain how this information will be relevant to upcoming lessons to **set expectations and support goal-setting (A)**. **Engage critical thinking (A)** by asking the students to write their own key takeaways on "exit tickets," which the teacher can use to **identify learning gaps (R)**.

Photo: GST BOCES

Photo: NYS BOCES

TRY-IT ACTIVITY 1

Apply the framework above to one of the extension activities suggested in the lesson plan or another activity of your choice. Identify examples of UDL principle(s) and/or practices the activity addresses and propose two or three ways you could adapt the activity to go even further with UDL. Refer to the **UDL Principles** in the **Quick Reference Guide** on *page 2* for ideas.

EXTENSION ACTIVITY (CHOOSE 1)	UDL PRINCIPLES/PRACTICES ADDRESSED	WAYS TO GO FURTHER WITH UDL
Hands-on grafting activity Field trip to a local orchard, distribution center, or processing facility Guest speaker Research on crossbreeding techniques used to produce specific apple varieties Other:		

TRY-IT ACTIVITY 2

How could you make the lesson and/or extension activity more meaningful for the students in your CTE Agriculture course by:

Tip: Refer to the table on page 6 for information on student demographics and special populations within CTE and CTE Agriculture in New York State.

Ensuring students see images and examples of people like themselves working in agriculture?

Addressing specific barriers they might encounter (e.g., disabilities, access to resources, language skills)?

Making the lesson or activity more relevant to their identities, interests, local context, and/or career goals?

WHO ARE OUR STUDENTS IN CTE AGRICULTURE?

POPULATION	All U.S. CTE	All NYS CTE	NYS CTE AGRICULTURE
Female	46.7%	42.6%	**56.0%**
Nonbinary	*no data*	0.1%	***no data***
Students of Color	51.0%	59.0%	**46.6%**
American Indian or Alaskan Native	*0.9%*	*0.8%*	***0.8%***
Asian	*4.6%*	*12.3%*	***10.5%***
Black or African American	*13.1%*	*13.9%*	***11.3%***
Hispanic/Latino	*28.0%*	*29.4%*	***21.5%***
Native Hawaiian or Other Pacific Islander	*0.4%*	*0.3%*	***0.2%***
Two or More Races	*4.0%*	*2.3%*	***2.4%***
Individuals from Economically Disadvantaged Families	45.3%	59.7%	**56.3%**
Individuals Preparing for Nontraditional Fields	24.3%	18.0%	**32.6%**
Individuals With Disabilities (ESEA/IDEA)	10.7%	18.6%	**23.4%**
Homeless Individuals	1.4%	3.5%	**3.0%**
English Learners	5.4%	3.5%	**2.1%**
Youth in Foster Care	0.2%	0.2%	**0.2%**
Youth With Parent in Active Military	1.0%	0.3%	**0.1%**
Migrant Students	0.3%	0.02%	**0.04%**

Sources: PCRN National Enrollment Profile, 2021-22; NYSED Enrollment Data, Secondary CTE Concentrators, 2022-23

GUIDED APPLICATION
GETTING STARTED WITH UDL IN CTE

Implementing UDL doesn't require special pedagogy or training. In fact, you're probably using UDL principles in your teaching without even knowing it! Here are a few ways you can build upon the good teaching you already do.

Complete a printed worksheet by hand or populate a digital copy to share with your principal, consultant teachers, or others who can support your UDL journey. If you share the sheet, don't forget to fill in your information below!

My name:

My CTE program(s) or course(s):

STRATEGY 1: IDENTIFY OPPORTUNITIES

For ***each*** of the three UDL principles, list one or two examples of strategies you're not currently using in your teaching, but you'd like to learn about or try. Indicate any resources, information, or support you need in order to be successful.

Refer to the **UDL Principles** in the **Quick Reference Guide** on page 2 for ideas.

ENGAGEMENT	REPRESENTATION	ACTION & EXPRESSION
[Example: I want to use polls or games to introduce lessons]	*[Example: I want to learn how to enable auto-captions in Google Slides]*	*[Example: I want to create graphic organizers to help students take notes]*
Resources required:	**Resources required:**	**Resources required:**

⚠ **Remember that UDL is not a checklist! You don't need to implement every practice to have a positive impact. Start with one or two small changes. See how they work for you and your students before adding others.**

STRATEGY 2: THE PLUS ONE (+1) APPROACH

Plus one (+1) means adding one option to each resource, activity, or assignment in a lesson or course, as appropriate. Start with options that require a minimal investment of your time and effort to build your momentum.

Choose a specific lesson or learning activity from your course. List each element of the lesson or activity, then propose a +1 for each element. Identify which UDL principle your +1 reflects and briefly explain how that principle is reflected.

Photo: SUNY

Tip: Refer to the examples in the row What Does It Look Like in Practice? in the table on page 2 to help you explain how your +1 represents one or more UDL principles.

For example:

- Add a short video to a traditional lecture for **multiple means of representation**.
  Bonus: *Make sure the video you select has captions or a transcript to double your impact!*
- Allow students to submit a video, podcast, infographic, or other creative product instead of a written essay, lab report, or research paper to provide **multiple means of action and expression**. Or, offer a choice of a multiple-choice quiz or an open-ended essay question to check students' comprehension.
  Bonus: *Foster critical thinking by inviting students to co-create assignment guidelines and grading criteria, propose quiz questions, and/or participate in peer assessment activities.*
- Offer **multiple means of engagement** by allowing students to choose whether to complete some learning activities individually or in teams. Or, let them choose their own topics and/or formats for assignments.
  Bonus: *Permitting a choice of formats is a UDL double-dip of boosting engagement AND providing options for action and expression!*

Lesson or activity title/topic:

WHAT YOU DO NOW	YOUR +1	WHICH UDL PRINCIPLE(S) DOES YOUR +1 REFLECT? HOW?