GUIDE TO **UNIVERSAL DESIGN FOR LEARNING** IN

CONSTRUCTION & TRADES

Building Futures and Pioneering Sustainable Horizons

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: Jefferson-Lewis 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 CONSTRUCTION & TRADES

1. Construction & Trades is a broad cluster that spans a wide range of occupations, subject areas, and industries. Through **self-directed learning**, UDL allows students to explore their unique interests and career aspirations.
2. Tasks in construction and skilled trades can be physically demanding and technically complex. UDL ensures that **students with disabilities or other barriers to learning are appropriately included and involved**.
3. UDL encourages **hands-on, project-based learning**. This authentic approach allows students to apply their expertise in real-world contexts, helping them become career-ready.
4. **Flexible learning strategies** complement students' technical proficiencies with in-demand "soft skills," such as critical thinking, teamwork and collaboration, and adaptability.
5. UDL demonstrates how products and environments can be **proactively and inclusively designed and constructed** to maximize their usability and accessibility for as many people as possible.

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 a CTE classroom.

Examples abridged and adapted from the lesson "Creating Common Wood Joints Using Woodworking Hand Tools" by Tim Newby: https://ctetac.us/constructionlesson

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

Photo: Orleans/Niagara BOCES, courtesy of Lisa Bielmeier

ELEMENT	WHY DOES IT WORK?	GO FURTHER WITH UDL
Learning goals: Students will construct 5 wood joints, select the proper woodworking hand tools, and demonstrate the proper use and care of hand tools.	Allows teachers to envision multiple ways students can achieve and demonstrate learning **(A)**. Identifies the prior knowledge and skills students will need to complete the lesson **(R)**.	Share the learning objectives for each lesson with students to **set expectations and short-term goals (A)**. Identify the academic, Common Career Technical Core, and cluster-specific industry standards to **illustrate the lesson's relevance** to students' career goals **(E)**.
Hook: We get to work in the Wood Lab!	Focuses attention and sparks curiosity **(E)**. Showing the finished products supports planning and strategy development **(A)**.	Recap or explain **how prior lessons and assignments have equipped students** to complete the lab activities **(A)**. **Conduct a poll, survey, or quiz game (E)** to support **recall and comprehension** of relevant prior knowledge and/or safety protocols **(R)**. Invite teams to complete jigsaw puzzles of the various joints to become familiar with their components **interactively and collaboratively (E)**.
Presentation on types of joints PowerPoint slides include illustrations of the joints and explain their required materials and characteristics.	Ensures all students have requisite background knowledge **(R)**. Illustrates using multiple media **(R)**. Previews tasks students will perform during activities **(A)**. Handout helps students organize notes and provides a reference for use during the lab and/or later review **(A)**.	Share lecture slides in digital format so all students can **preview or review the content at their own pace (A)** and **customize the display of information (R)**. **Underscore the lesson's relevance (E)** and **encourage critical thinking (A)** by prompting students to **identify examples or use cases** for different types of joints **(A)**. Review the lecture content in a **game or interactive quiz (E)** to **assess students' comprehension (R)** and **support encoding in long-term memory (A)**.

ELEMENT	WHY DOES IT WORK?	GO FURTHER WITH UDL
Demonstration The teacher demonstrates how to construct all 5 wood joints.	Ensures all students have the requisite background knowledge to complete the hands-on activity **(R)**. Pace and delivery can be adjusted or adapted for student needs (e.g., pause, repeat, slow down) **(R)**. Recorded demos provide an alternative format and illustrate using multiple media **(R)**. Safety considerations are addressed to minimize risk **(E)**.	Offer written step-by-step instructions as a **reference/memory aid for the hands-on activity (A)** and an **alternative format for verbal instructions (R)**. Pause periodically and after each joint is demonstrated to **check for understanding (R)**. Ensure videos are accurately captioned and/or offer a transcript (in English or an ELL's home language) to **ensure information is accessible to all students (R)**. Share videos in advance so students can **preview the demonstrations to support comprehension (R)** and **watch them at their own pace (A)**.
Hands-on team activity Students construct the 5 wood joints as the teacher observes their progress.	Content and tasks are relevant to students' personal and career interests **(E)**. Demonstration of skills allows students to "show what you know" and minimizes potential language barriers **(A)**.	Permit students the **choice of working individually or in groups (E)**. Facilitate a peer review activity to **promote collaboration (E)**, **provide feedback (E)**, and **engage critical thinking (A)**. Engage more experienced students as "helpers" who can offer **peer support and assistance (E)**.
Summative assessment Final products are graded and students receive "lab points" for progress, safety, and collaboration.	Assessment rubrics are provided for each type of joint to clarify specific expectations for performance **(A)**. Students who receive scores lower than 6/10 may resubmit their work to learn from mistakes **(E)**.	Grades are based on the quality of the finished products as well as students' **participation in the learning process (E)**. Explain how rubrics can be used for **planning and strategy development** and **self-assessment** of final products **(A)**.

TRY-IT ACTIVITY 1

Apply the framework above to a supplemental 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
Student-created job aid or demo video on how to construct one joint Peer evaluation activity Guest speaker Field trip to a production facility, workshop, or construction site Participation in a SkillsUSA event or industry competition Other:		

TRY-IT ACTIVITY 2

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

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

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

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 CONSTRUCTION & TRADES?

POPULATION	All U.S. CTE	All NYS CTE	NYS CTE ARCHITECTURE & CONSTRUCTION
Female	46.7%	42.6%	**14.9%**
Nonbinary	*no data*	0.1%	***no data***
Students of Color	51.0%	59.0%	**53.7%**
American Indian or Alaskan Native	*0.9%*	*0.8%*	***1.0%***
Asian	*4.6%*	*12.3%*	***7.5%***
Black or African American	*13.1%*	*13.9%*	***12.6%***
Hispanic/Latino	*28.0%*	*29.4%*	***30.1%***
Native Hawaiian or Other Pacific Islander	*0.4%*	*0.3%*	***0.3%***
Two or More Races	*4.0%*	*2.3%*	***2.3%***
Individuals from Economically Disadvantaged Families	45.3%	59.7%	**56.6%**
Individuals Preparing for Nontraditional Fields	24.3%	18.0%	**14.9%**
Individuals With Disabilities (ESEA/IDEA)	10.7%	18.6%	**20.8%**
Homeless Individuals	1.4%	3.5%	**3.0%**
English Learners	5.4%	3.5%	**4.7%**
Youth in Foster Care	0.2%	0.2%	**0.1%**
Youth With Parent in Active Military	1.0%	0.3%	**0.3%**
Migrant Students	0.3%	0.02%	**0.0%**

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: NYC CTE

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?