



Laying the Foundation for Universal Design for Learning in Physical Education: An Interactive Infographic

Universal Design for Learning (UDL) has emerged as a framework that uses a variety of teaching methods to remove barriers and increase access to learning to provide ALL students equal opportunities to learn and succeed. The UDL framework, developed by the Center for Applied Special Technology (CAST) is an evidence-based educational framework that benefits all learners, including, but not limited to, students with disabilities. UDL holds particular value during this time of shifting teaching modalities as a result of the pandemic and teachers' needs for instructional delivery under challenging conditions. As a result, the National Center on Health, Physical Activity and Disability (NCHPAD) in collaboration with the National Consortium for Physical Education for Individuals with Disabilities (NCPEID) has created the interactive visual resource **Laying the Foundation for Universal Design for Learning in Physical Education** to provide general information on the core components of UDL. In addition, the tool suggests recommended strategies to facilitate the implementation of UDL in all physical education settings-no matter what the teaching modality.

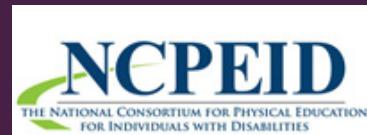


How to use the infographic: The core components of UDL are depicted as part of the solar system. The sun represents the UDL framework and the planets, stars, and constellations represent the core components of UDL. The images on the infographic are connected to a hyperlink that has information related to its title. For example, UDL will have a hyperlink to a separate one-pager with information specific to the definition of UDL. Click on each image to access the related information.

Scan the QR code for more



Follow this link to view the interactive UDL Infographic





Variety of skateboards for students to choose during a skateboard lesson



Universal Design for Learning (UDL) What is UDL?

The Center of Applied Special Technology (CAST) defines Universal Design for Learning (UDL) as a framework to reduce barriers and improve and optimize teaching and learning for all individuals based on scientific insights on how humans learn.¹ A more detailed definition is an “instructional planning and delivery framework intended to increase meaningful access and reduce barriers to learning for students with diverse learning needs.”² The UDL framework emerged from architectural concepts and the understanding that physical environments could be accessibly designed so that all individuals, irrespective of age, gender, and disability could easily, and without notice, have access to the building and its resources. These same principles can be applied to the physical education setting.

The UDL framework for how to develop lesson plans, apply instruction and conduct assessments is based on three main principles:

Engagement Component 1	Representation Component 2	Action and Expression Component 3
Stimulating students' interests and motivation for learning in a variety of ways	Presenting information and course content in multiple formats so that all students can access it	Allowing students alternatives to express or demonstrate their learning

Benefits of UDL- UDL has clear elements of the important role of environmental arrangement, as well as the techniques that can be applied in reinforcing students' practice. Moreover, it contains all the features of a dynamical systems way of thinking, in which one considers the learner, the environment, and the task when planning and implementing activities. It is hard to miss its similarity to UDL, with its focus on arranging environmental and social conditions in ways that allow for all students to be more successful as they participate in motor activities.³



Teacher communicating with student using sign language

The main benefits of utilizing UDL are 1) the various ways of instructing to gain attention throughout the lesson, 2) the multiple means of engagement to motivate students, and 3) the opportunity to allow students to show what they know in a variety of individualized ways. Everyone Succeeds!

Examples of UDL in Physical Education⁴

- Audio, visual, and kinesthetic approaches specific to the needs of the student are used.
- The teacher distributes as much equipment as possible to maximize opportunities to respond. Alternative options to commonly used equipment in the gym are suggested for remote learning.
- Timers provide structure for students to prepare for class and collect equipment.
- A variety of teaching strategies are used including peer and para supports, visual modeling and sign language.
- Technology is used to support and supplement both remote and face-to-face learning.
- The class is designed so that options and class membership in the is supported.
- Mild, medium, and spicy options are provided for completing a skill.



Mild option: student batting off a tee



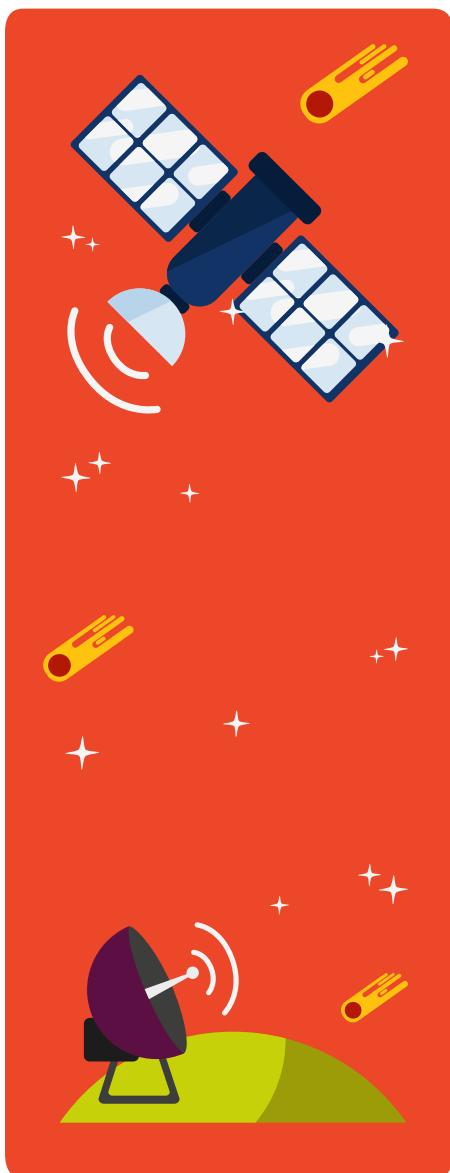
Medium option: student batting a self-toss ball



Spicy option: student batting a ball from a pitch

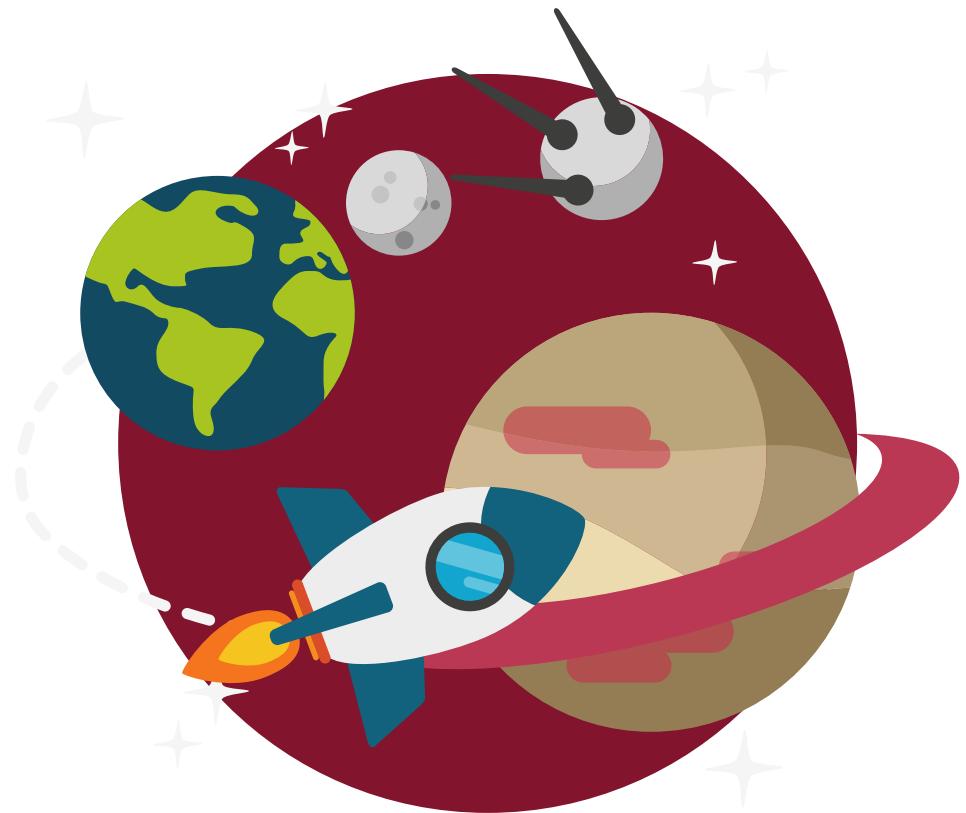
Recommended resource:

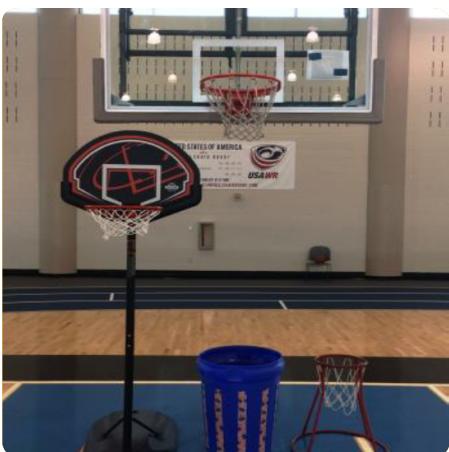
- [Physical Education & Universal Design for Learning – video](https://www.cast.org/our-work/about-udl.html#.WukPFdMvxME)
- [Universal Design for Learning Guidelines](https://www.cast.org/our-work/about-udl.html#.WukPFdMvxME)



Citation:

1. The UDL Guidelines. (2020, October 06). Retrieved January 12, 2021, from https://udlguidelines.cast.org/?utm_source=castsite&utm_medium=web&utm_campaign=none&utm_content=aboutudl
2. About Universal Design for Learning. (2020, December 02). Retrieved January 12, 2021, from <http://www.cast.org/our-work/about-udl.html#.WukPFdMvxME>
3. Lieberman, L., Grenier, M., Brian, A., & Arndt, K. (2020). [Universal Design for Learning in Physical Education](#), Champaign, IL: Human Kinetics
4. Lieberman, L. & Grenier, M. (2019) Infusing Universal Design for Learning into Physical Education Professional Preparation Programs, *Journal of Physical Education, Recreation & Dance*, 90:6, 3-5, DOI: [10.1080/07303084.2019.1615790](https://doi.org/10.1080/07303084.2019.1615790)





Basketball goals of different sizes and heights



Equipment used to develop locomotion skills

Engagement

Multiple means of engagement is the **why** of learning—utilizing strategies to get students motivated and excited about learning, to help them sustain interest in learning tasks, and to know how to regulate themselves. One of the first things to consider is reducing students' discomfort and distraction and to urge each student to take risks without being forced out of his or her comfort zone. Once factors affecting student comforts such as room lighting, temperature, furniture, equipment arrangement, noise, and emotional climate are addressed, considerations about getting students' interest in learning are next. One of the best suggestions to capture students' interest is to give students choice and autonomy and offer tasks that are meaningful and authentic.



Recommended resource:

- Winter Olympics – [video](#), Santa Ana APE YouTube Channel
- [Activity and Adaptation Cards](#)



Visual representation of types for a fitness circuit



Teacher using a visual to show an exercise routine

Recommended resource:

- [Adaptive Juggling with Ms. Nelson – video](#)

Representation

Multiple means of representation is the **what** of learning—how information is given or delivered to students. Giving information to students is the first part; using text and pictures, demonstrations, videos, posters charts, 3-D models, or even cues as supports, ensures that all students will be able to make sense of the content. Consider the teaching modality (face-to-face, hybrid, asynchronous, and remote) and the students you are working with. Consider your language, use of symbols and how the skill is presented. You can also choose to show a lesson or a video with a student demonstrating skill and fitness exercises to highlight the fact that all learners can demonstrate physical activity and skill development. Students who use English as a new language, who use nonacademic language outside of school, or who need challenges to skill acquisition will benefit from multiple means of representation. As a teacher, you will be building a culture of acceptance while providing supports to create a learning environment where all students succeed and feel comfortable asking questions.

Some examples of means of representation applied to physical education are: 1) using students for demonstration, 2) showing a video of the skill or sport to be practiced, or 3) demonstrating the skill or activity yourself with the students verbally following along.





Student demonstrating target skills while utilizing a launch ramp



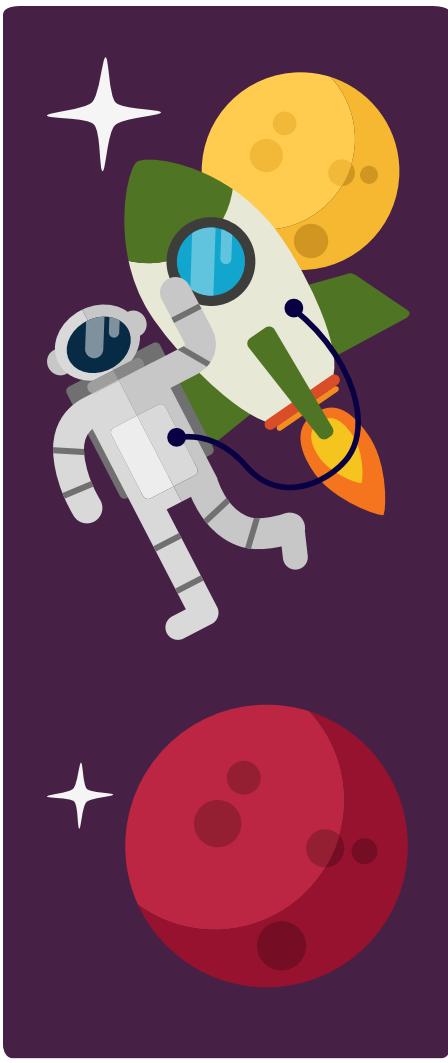
Recommended resource:

- [Recommended resource: Universal Design for Learning: UDL – video](#)

Action & Expression

Multiple means of action and expression—is the **how** of learning—how can you assess and have evidence on what your students know? Consider removing barriers to learning by utilizing support and being flexible with the students' capacity and ability to show you what they know. In this area, provide ways for students to move—to jump, stand, wave their arms, stretch, and bend as a “true” expression of their learning given the type of modality you are using. Give options for students to express what they know and can do, and you will be surprised at what you can learn. For example: when assessing how fast students can run, allow them to choose the distance and the way they want to run, who they run with, the music that is playing, and the goals that they set. To ensure authenticity, have the students pre-set these as goals so they are clear on what they are being assessed on. When assessing the serve in volleyball for example, provide choice as to ball selection, distance from the net, and the way they serve which could include underhand, overhand, or by throwing the ball. The goal or assessment here is to successfully serve a ball over the net. Help students set goals and manage information and by teaching students how to monitor their progress toward learning goals. This can also enhance their engagement in class.





Example of representation of role models – picture of Paralympian Tatyana McFadden - [bio](#)

UDL application

An important aspect of UDL for teachers is to know that it must be infused into the lesson plan from the beginning and not added as an afterthought. In addition, UDL concepts are available for all students in the class so that each student can access learning without being singled out. So, if the teacher offers a tee as an option in baseball, it should be an option for all students, and a rope-less jump rope can be used by all students remembering that this provides choices to students. You will be surprised just how many students elect to use equipment that will enable them to be successful. See Table 1 for more examples.

Table 1. Examples of UDL in Physical Education

Multiple Means of Engagement

- Timers to alert students to prepare for class.
- A clipboard that displays equipment needed and skills to be practiced.
- An opportunity for students to socialize particularly if they are learning remotely.
- Music is playing and the screen or gymnasium is inviting.

Multiple Means of Representation

- Audio, visual, kinesthetic, and approaches specific to the needs of the students in the class.
- Utilize a variety of teaching strategies including peer supports and visual cues, such as poster boards and other reminders.

Multiple Means of Action and Expression

- All students are assessed in the class according to his or her ability and skills.
- Prepare students for assessment so they comprehend and value what and why they are demonstrating what they know.

Physical education is one place where teachers can affect change, and appropriate programming can have lifelong implications for children's health and well-being. We want to encourage all teachers to consider how the principles of UDL can be utilized in their classrooms to encourage and promote their students' physical

Recommended resource:

- Lieberman, L. & Grenier, M. (2019) Infusing Universal Design for Learning into Physical Education Professional Preparation Programs, *Journal of Physical Education, Recreation & Dance*, 90:6, 3-5, DOI: [10.1080/07303084.2019.1615790](https://doi.org/10.1080/07303084.2019.1615790)
- Mastro, J., Ahrens, C., & Statt, N. (2012) Using role models to help celebrate paralympic sport, *Journal of Physical Education, Recreation & Dance*, 83:4, 28-30, DOI: [10.1080/07303084.2012.10598759](https://doi.org/10.1080/07303084.2012.10598759)

literacy. See Table 2 for specific examples of a soccer lesson plan that include engagement examples, representation, and action/expression.

Table 2. Specific examples of a soccer/dribbling lesson plan.

Engagement examples

- Ball options-choice (many)
- Team/partner options
- Music preference
- Preferred skill challenge (distance/accuracy)
- Skill choices
- Students leading warm-ups
- Target themes can be the children's preference such as characters from Frozen, Star Wars, or Sponge Bob

Representation

- Teacher demonstration
- Peer demonstration
- Video reinforcement (show power soccer, Cerebral Palsy soccer and 5-a-side soccer)
- Role models such as Tatyana McFadden, or any other local role model
- Closed captioning

Action/Expression

(Ways to share what they know according to their ability)

- Variety of ways to demonstrate kicking ability (to target, to peer, and/or dribbling)
- Variety of target sizes, distances, and defender options
- Variety of speeds, directions, and obstacles such as cones or defenders
- Variety of ways to express knowledge of rules, strategies, or scoring that may not always include physical demonstration.



Universally Designed sitting volleyball lesson



Equipment used during sitting volleyball lesson

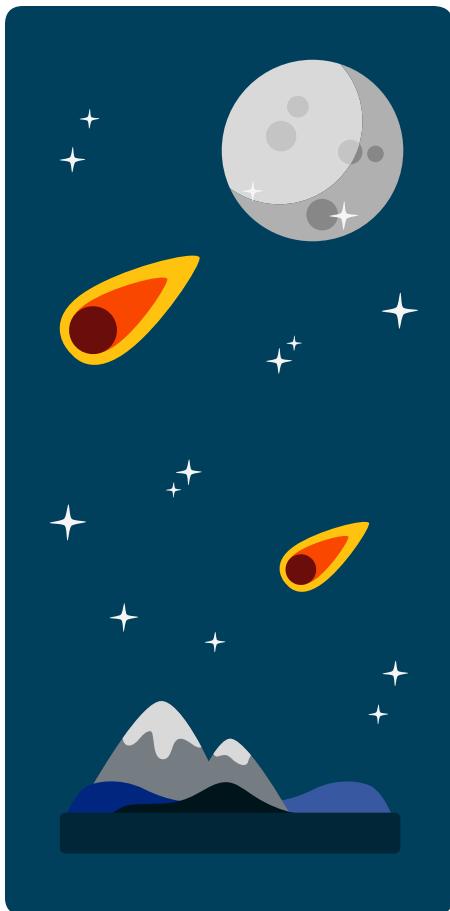
Types of Learners

Students differ in their learning styles. Learning styles involve those who learn best by auditory means, those who learn best visually, and those who learn best by hands-on or tactile means. Others may learn best while working with peers, or in small or large groups, or in a more isolated situation. In many cases, students may require more than one learning style to fully grasp the concepts being taught. Teachers should take into account the characteristics of their students when determining strategies to use, such as various learning styles; ways in which students process information; and the use of multiple intelligence theory. Knowing your learners is critically important in successful lesson planning and arrangement of the learning environment, including grouping strategies. See Table 1 to learn about the characteristics of each type of learner and things to consider for better learning.

Table 1. Types of learners, characteristics, and considerations for learning

Type of learner	Characteristics	Considerations
Kinesthetic 	Benefit from movement	Opportunities to physically engage in the activity in a variety of ways
Sensory engagement (high/low) 	May need more stimulation (music) or less stimulation (smaller pace; limited equipment)	Consider the sensory input related to the space and environment
Visual 	Visual (pictures; modeling)	Make sure the student can "see" what you want them to learn
Auditory 	Benefit from peer-supported learning	Demonstrate and describe the skill that they should perform

Special consideration: Ensure you are providing a variety of instructional modalities to meet the needs of all learners. For example, when teaching virtually, the teacher can provide



different visuals and cues to support comprehension. Various modes of instructional modalities could be facilitated by utilizing technology such as different types of visuals and videos. Teachers should ensure that the curriculum is accessible by facilitating content materials prior to the lesson for the students to check the compatibility of instructional aids and equipment.



Recommended resource:

- Ellis, K., Lieberman, L., & LeRoux, D. (2009). Using Differentiated Instruction in Physical Education . *Palaestra*, 83, 28-30 .<https://sites.aph.org/physical-education/articles/using-differentiated-instruction-in-physical-education/>

Before Class

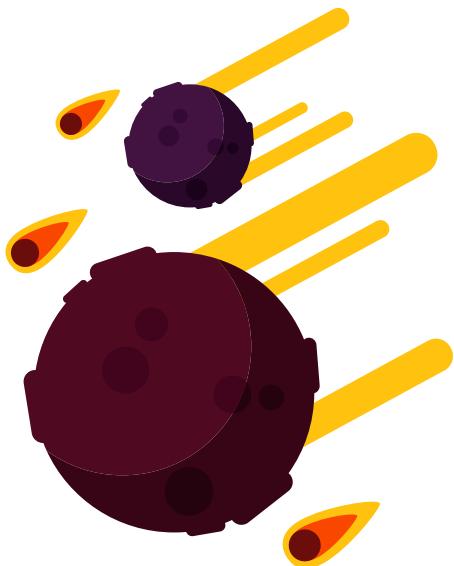


Teacher planning and thinking about the different students in her class

Planning is essential! UDL starts in the lesson planning phase. It is not something that is added after the lesson is created. The variations need to be embedded in the lesson from the start. Teachers should focus on ways to present opportunities for learning (multiple ways of representation) rather than specifically focusing on the activity. UDL means that the teacher thinks about and plans for all students before they arrive in class. The planning process is not exclusive to the teacher. Para-educators, peer mentors, and aides should actively collaborate with the teacher during the lesson planning. See Table 1 to learn about the steps that you should take before planning your lesson.

Table 1 Questions to ask before you plan your lesson

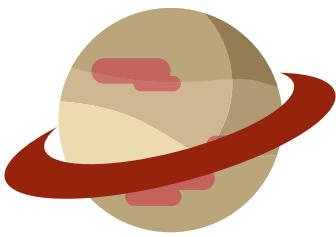
*Adapted from Universal Design for Learning in Physical Education – Lieberman et al., 2020



Recommended resource:

- The UDL Project – lesson plan [template](#), daily [planner](#), daily [checklist](#)

Question	Specific ideas to support the question
1. What are my desired results or the goals of the lesson?	Look at SHAPE America or your own state standards level outcomes, modified as needed for the students.
2. What is acceptable evidence of student understanding?	Consider a variety of ways for the students to demonstrate the skill, videos, bulletin board, poster, technology, or apps such as Padlet and Flipgrid
3. What learning experiences will address the goal and consider learner strengths, interests, and preferences?	Consider the STEPS process in your teaching: SPACE, TASK, EQUIPMENT, PEOPLE and SUPPORTS. One size will definitely not fit everyone.
4. How can assistive technology be incorporated into the lesson?	Use visuals such as a white board, projector, or other equipment that accommodates a range of skills. There are several applications that can be used to enhance learning.
5. How can you choose units and activities that reflect what students do in the community?	Consider lifetime activities and those sports that students will do after they graduate. Biking, swimming, throwing, and catching are examples of sports and skills that are used across a lifetime.



During Class

Learning activities through the UDL framework should consider the variability in individual skills, learning styles and preferences, age, gender, sexual orientation, culture, abilities, and disabilities. Physical educators must align the curriculum activities to these specific students' characteristics by selecting the appropriate content and strategies to deliver instruction while infusing all three principles of UDL in their course activities and resources. Below are strategies that can be adopted by the physical education teacher when implementing UDL during class.¹

Citation:

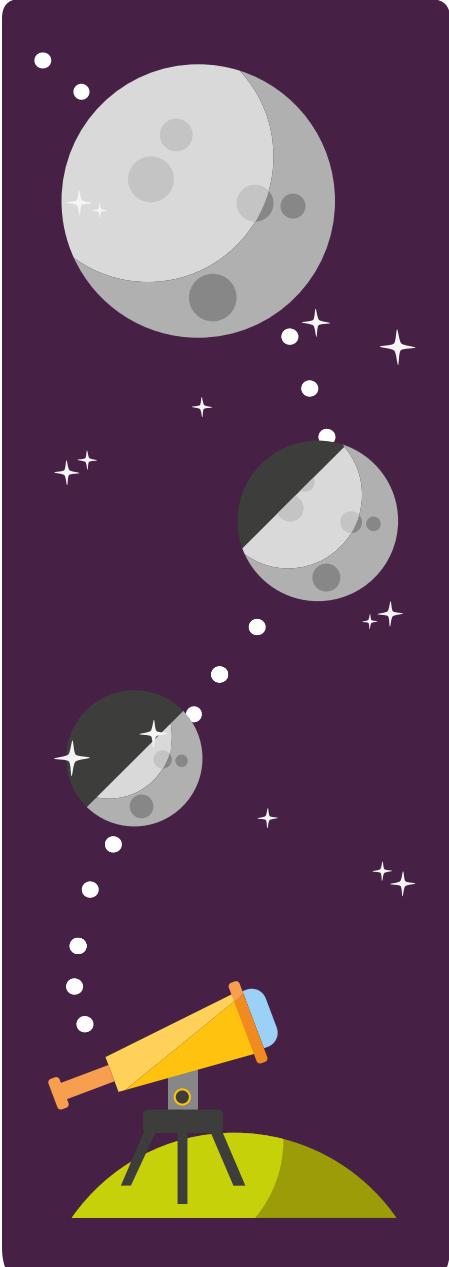
- 1. Equal Access: Universal Design of Instruction. (n.d.). Retrieved January 14, 2021, from <https://www.washington.edu/doit/equal-access-universal-design-instruction>

Recommended resource:

- [Lieberman, L.J., Grenier, M., Brian, A., & Arndt, K. \(2020\). Universal design in physical education. Champaign, IL: Human Kinetics.](#)
- <https://www.washington.edu/doit/equal-access-universal-design-instruction> , <https://www.novakeducation.com/remote-or-not-udl-lessons-still-apply/>

- Consider all three aspects of UDL implementation.
- Gauge students' level of involvement in the class.
- Challenge students; provide specific and general feedback by using their first names.
- One size does not fit all. Each student will have their own skillset and learning style.
- Consider the diverse characteristics of students.
- Provide accommodations as needed.
- Avoid segregating or stigmatizing any student.
- Address individual needs in an inclusive manner.
- Motivate all students.
- Require inclusive cooperative learning.
- Offer multiple options for communication and collaboration.
- Ensure physical access to facilities.
- Arrange instructional spaces to maximize inclusion and comfort.
- Ensure that everyone can use equipment and materials.
- Ensure safety.
- Provide multiple ways to learn.
- Use large visual and tactile aids.
- Provide content in accessible, universally designed formats.
- Ensure the availability of appropriate assistive technology.
- Offer regular feedback and corrective opportunities.
- Provide multiple ways for students to demonstrate what they have learned.
- Treat disabled students with the same respect and consideration with which you treat others.
- Be descriptive.
- Offer directions or instructions both orally and in writing.
- Listen carefully.
- Allow opportunities to address specific questions.

After Class



Looking back gives physical education teachers the opportunity to assess not only the program curriculum but the effectiveness of the curriculum implementation and the impact that the learning experiences had on the students. Teachers can also benefit from reflection and assessments. It helps them to understand how success was created, how UDL impacted the learning experience and promoted physical education literacy, and it provides a clear picture of what did not work as planned and where to make adaptations and improvements. This is a continuous process that will benefit the students, teachers, and everyone involved in creating a successful learning environment. It is important to collect and regularly document the students' reactions and experiences during the physical education class. This will help the teacher to understand the impact of inclusion efforts during physical education. Use creative ways to gather students' feedback such as observations, comment cards, drawings, reflections, informal interviews, and others.

Below are a few areas to consider after class:

- Reflect on students' learning outcomes
- Reflect on students' behaviors
- Reflect on students' level of engagement and skill development
- Reflect on your teaching and what would improve your lesson



Recommended resource:

- [Lieberman-Brian Inclusion Rating Scale \(LIRSPE\)](#)



Student performing arm jacks for a muscular endurance test

Assessment

Teachers evaluate and assess students' learning for many reasons. Assessment can help determine the effectiveness of your curriculum and your teaching, help evaluate your students' improvement, and can provide baseline information on achievement levels. Assessment can also help students express what they know. Consider the elements of UDL at all stages of assessment development. Present the items in a format that is similar to the way the students are learning and will perform the skill. And finally, try out and refine the assessment. There might be cases where some students are able to express themselves easily through demonstrations of psychomotor skills, whereas others may best represent their learning orally. According to the CAST (2019) site, prioritize the following when considering assessments:

- Align assessments to learning goals.
- Offer authentic opportunities for assessment.
- Make sure students are engaged in the content.
- Assess frequently. Vary how you assess.
- Make your assessment available to all students.
- Reflect on summative assessments for future lesson designs.

Alternative assessments – Digital media can provide multiple opportunities for students to develop the skills required to learn and express concepts. Videos or pictures showing the skill, or a movement sequence can assist students in understanding the concept by enabling them to create better mental imagery of the skill, fitness concept, or activity. The most important point is that you must help all students meet their full potential in physical education by setting up clear goals and strategies to showcase their skills. You must have high expectations for all your students and determine individual avenues for improvement.

Recommended resource:

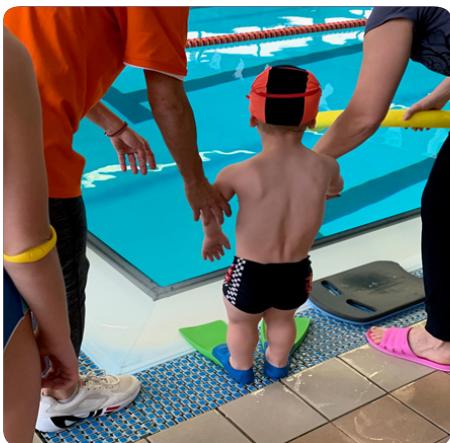
- [Dear Teacher: Heartfelt Advice for Teachers from Students – Video](#)
- [NCHPAD Discover Inclusive Physical Education](#)



Laying the Foundation for Universal Design for Learning in Physical Education: An Interactive Infographic



Students participating in an afterschool inclusive program



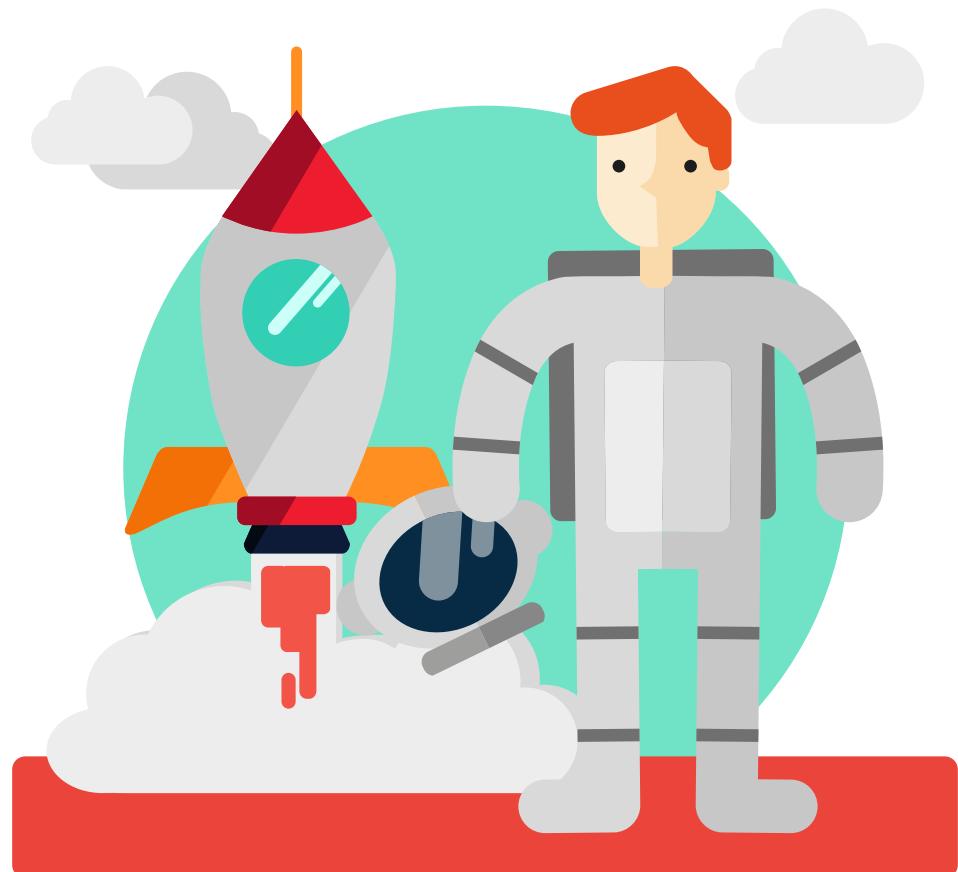
Students participating in a community camp



Community partner speaking at a school assembly

Transition to Community

Community partners are sports, recreation, and fitness businesses in the community that can come into your school and do a lesson for your students on their programs. This way, they meet children in the community and the students learn about what is locally available to take advantage of with their families. These community partners can see the needs of your students and be better prepared to meet the needs once they visit your school. Teachers can enhance the level of success of students participating in community sports and recreation programs by implementing community disability sports in the curriculum.



Recommended resource:

- [What's New in Adapted Physical Education \(Transition in APE\) – podcast](#)



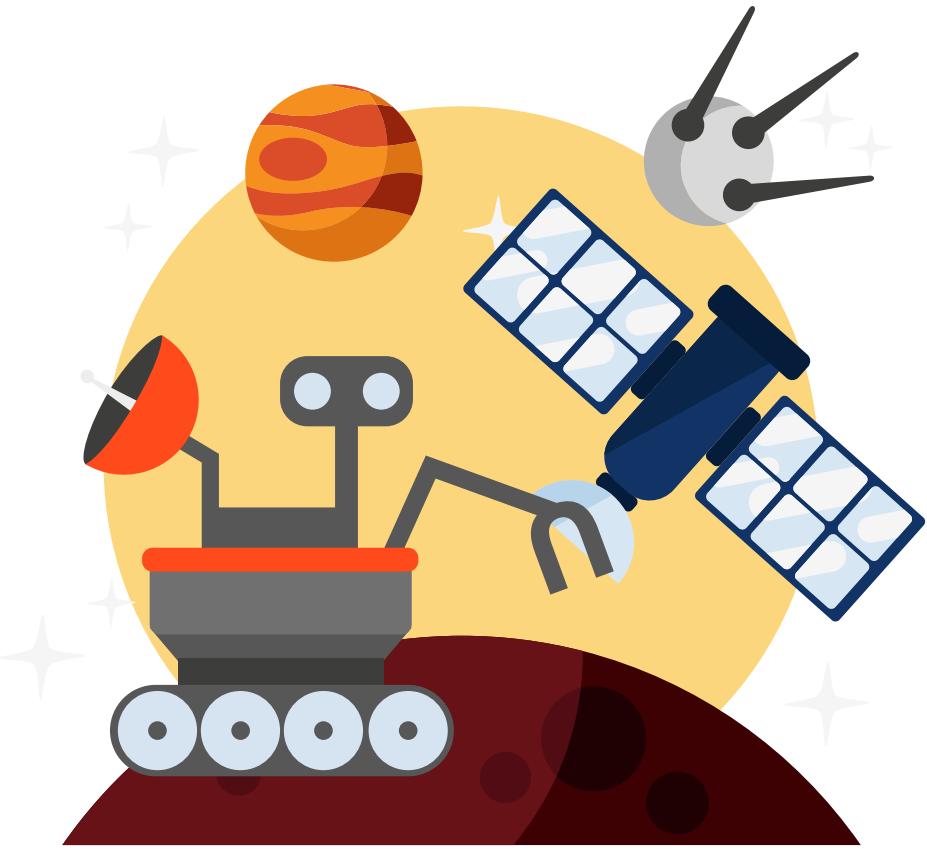
Student batting off a tee



Kids shaking hands after a competition

Lieberman-Brian Inclusion Rating Scale (LIRSPE)

LIRSPE is a tool that can be used to support educators when planning, instructing, and assessing students, so that all students, including those with disabilities, can be active and contributing members in physical education (PE). The tool addresses multiple components of the classroom environment such as support, equipment options, and classroom management protocols that will ensure students are accessing the curriculum and learning the content in accordance with the SHAPE America grade level outcomes. The LIRSPE can be used to help strengthen programs by identifying areas in need of improvement. The tool can be used in teacher education programs to help pre-service teachers learn about inclusive physical education environments, or it can be used for practicing teachers to examine and/or evaluate the teaching environment. Most importantly, the tool will support teaching professionals in making lifetime physical activity a priority for all students.



Recommended resource:

- [Lieberman-Brian Inclusion Rating Scale \(LIRSPE\)](#)