Universal Design for Learning: High School Lesson Planning

PowerPoint Slides
to be used in conjunction
with the Facilitator’s Guide
Recommended citation:

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Session Agenda

• Introduction
• Session Goals and Objectives
• Four Components in UDL Curricular Design
• UDL Lesson Plan- Academic, Social and Physical Barriers
• UDL Lesson Plan- Preplanning Guide
Session Agenda, continued

• UDL Lesson Plan- The Lesson Components
• Summary
• Evaluation
Introduction

“It isn’t that they can’t see the solution. It is that they can’t see the problem.”

-G. K. Chesterton

The problem

• Watch the video about co-teaching at http://mast.ecu.edu/modules/udl_hslp/lib/media/slides01/SlideShow.html.
Introduction, continued

• Planning a UDL lesson is similar to planning for a road trip.

• Just as in planning a road trip, teachers first need to know where they are going.
  – What is the desired destination?
  – What is the budget?
• Once determined, different routes to reach the desired goal can be considered.
  – The number of travelers and their needs must be considered as well as the means of transportation.
  – How much time is needed to reach the destination safely and realistically?
  – There might be some detours or barriers. What are they?
Introduction, continued

– If two drivers, who will drive and navigate?
– How will expenses be handled?
– If children are going, how will they be entertained and fed?
– Perhaps someone who uses a wheelchair is joining the group.
– The better the plan is up front, the more enjoyable the trip will likely be. The odds of reaching that destination safely, on time, and in a good mood definitely increase!
Introduction, continued

• Listen to the audio about UDL lesson planning at http://mast.ecu.edu/modules/udl_hslp/lib/media/audio.Audio02-Narrator2.mp3.
Session Goal and Objectives

• The goal of this module is to demonstrate how teachers at the high school level can plan effectively for all learners using a UDL lesson plan format.
Session Objectives, continued

Objectives: Participants will be able to:
1. Identify and explain the four UDL curricular components in academic learning.
2. Brainstorm multiple ways to address learner academic, social and/or physical barriers using UDL principles.
Session Objectives, continued

3. Distinguish between the terms *accommodation* and *modification* when considering adaptations.

4. Recognize expanded traditional lesson plans to increase their effectiveness with diverse learners, including pyramid planning.
Four Components in UDL Curricular Design

• The four components of UDL curricular design are:
  1. goals,
  2. assessment,
  3. methods, and
  4. materials and resources.

• Mr. Hill and Ms. Parks will provide us examples when we take a closer look at each one of these important elements.
Four Components, continued

Component 1: Goals
Four Components, continued

• What’s the big idea?
• "A big idea is a concept, theme, or issue that gives meaning and connection to discrete facts and skills."

Four Components, continued

• When planning, teachers must be sure to plan with the goals or 'big ideas' in mind.
  – What are the core concepts, principles, or processes the students must to be able to do?
  – What are the essential questions?
  – What learning is important and why?

• Articulating the big ideas will set the stage for all teaching and learning that follows.
Four Components, continued

• Teachers today must refer to many national, district, and state standards to determine the destination of their lessons.

• We must also consider pacing guides and individual education plans.
Four Components, continued

- Watch the slide presentation of Examples of Big Ideas at
  http://mast.ecu.edu/modules/udl_hslp/lib/media/slides02/SlideShow.html
Examples of Big Ideas

In Math

• Equivalence and Equations
• Patterns and Functions
• Properties
• Representation
• Geometry and Spatial Sense
• Data Analysis, Statistics, and Probability
Examples of Big Ideas

In Science

• Systems, order, organization
• Constancy, change, measurement
• Form and function
• Evidence, models, explanations
• Evolution, equilibrium
Four Components, continued

- **Concepts to Big Ideas**
- Listen to audio about transferring concepts to big ideas at
  [http://mast.ecu.edu/modules/udl_hslp/lib/media/audio/Audio04-Mike1.mp3](http://mast.ecu.edu/modules/udl_hslp/lib/media/audio/Audio04-Mike1.mp3)
Four Components, continued

Standard Course of Study Objectives

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA.A.5.1</td>
<td>Represent linear relationships in the form of models</td>
</tr>
<tr>
<td>MA.A.5.2</td>
<td>Use strategies to solve systems of linear equations in two variables, graphically and symbolically.</td>
</tr>
</tbody>
</table>

*Source: North Carolina Department of Public Instruction, 2010-2011.*
Four Components, continued

- Listen to audio of Ms. Parks talk about learning objectives at http://mast.ecu.edu/modules/udl_hslp/lib/media/audio/Audio05-Debbie1b.mp3.
Four Components, continued

• **Lesson Objective Verbs that Increase Access**

• Watch the slide show at [http://mast.ecu.edu/modules/udl_hslp/lib/media/slides03/SlideShow.html](http://mast.ecu.edu/modules/udl_hslp/lib/media/slides03/SlideShow.html)
Verbs that Increase Access
To represent...

To use...

To express...

To Tell...

To Draw...

To Write...
Four Components, continued

Component 2: Assessment
Four Components, continued

• Listen to the audio of Mr. Hill talking about assessment at http://mast.ecu.edu/modules/udl_hslp/lib/media/audio/Audio07-Mike2-Assessment.mp3

Then watch the slide show at http://mast.ecu.edu/modules/udl_hslp/lib/media/slides04/SlideShow.html
Lesson Objective/s:
• To determine whether a system of linear equations has 0, 1, or infinitely many solutions.
• To solve systems of equations by graphing.

Assessment/s: Expressing solutions using student-produced graphs of linear equations. Students will explain their solutions.
composite function

If \( H(x) = \frac{1}{x+1} \).

Thus, if we let \( f(x) = \frac{1}{x} \) and \( H(x) \).

In Problems 31-46, for the given function:
(a) \( f \circ g \)
(b) \( g \circ f \)
(c) \( f \circ f \)

State the domain of each composite function:

31. \( f(x) = 2x + 3 \); \( g(x) = 3x \)
33. \( f(x) = 3x + 1 \); \( g(x) = x^2 \)
35. \( f(x) = x^2 \); \( g(x) = x^2 + 4 \)
37. \( f(x) = \frac{3}{x-1} \); \( g(x) = \frac{2}{x} \)
39. \( f(x) = \frac{x}{x-1} \); \( g(x) = \frac{-4}{x} \)
41. \( f(x) = \sqrt{x} \); \( g(x) = 2x + 3 \)
43. \( f(x) = \sqrt{x+1} \); \( g(x) = \frac{2}{x-1} \)
45. \( f(x) = ax + b \); \( g(x) = cx + d \)

In Problems 47-54, show that \((f \circ g)(x) = (g \circ f)(x) = x.\)

47. \( f(x) = 2x \); \( g(x) = \frac{1}{x} \)
48. \( f(x) = 4x \); \( g(x) = \frac{1}{4x} \)
50. \( f(x) = x + 5 \); \( g(x) = x - 5 \)
Four Components, continued

• **Learner Considerations**
• Last, but certainly not least, we think about potential learning barriers for our learners.
• Consider IEPs, BIPs, Section 504 information (Rehabilitation Act, 1973), assessment data, and our own observations and knowledge of each student.
• Consider multiple intelligences, learning preferences, and student interests.
Learner Considerations
Learner Considerations

✓ Individual Educational Plan (IEP) goals, objectives, adaptations
Learner Considerations

✓ Individual Educational Plan (IEP) goals, objectives, adaptations
✓ Behavior Intervention Plan (BIP) goals
Learner Considerations

✓ Individual Educational Plan (IEP) goals, objectives, adaptations
✓ Behavior Intervention Plan (BIP) goals
✓ 504 plans for accommodations
Learner Considerations

- Individual Educational Plan (IEP) goals, objectives, adaptations
- Behavior Intervention Plan (BIP) goals
- 504 plans for accommodations
- Language needs
Learner Considerations

✓ Individual Educational Plan (IEP) goals, objectives, adaptations
✓ Behavior Intervention Plan (BIP) goals
✓ 504 plans for accommodations
✓ Language needs
✓ Formal and informal assessment data
Learner Considerations

✓ Individual Educational Plan (IEP) goals, objectives, adaptations
✓ Behavior Intervention Plan (BIP) goals
✓ 504 plans for accommodations
✓ Language needs
✓ Formal and informal assessment data
✓ Giftedness
<table>
<thead>
<tr>
<th>Learner Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Individual Educational Plan (IEP) goals, objectives, adaptations</td>
</tr>
<tr>
<td>✓ Behavior Intervention Plan (BIP) goals</td>
</tr>
<tr>
<td>✓ 504 plans for accommodations</td>
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<tr>
<td>✓ Language needs</td>
</tr>
<tr>
<td>✓ Formal and informal assessment data</td>
</tr>
<tr>
<td>✓ Giftedness</td>
</tr>
<tr>
<td>✓ Multiple intelligences/Preferences/Interests</td>
</tr>
</tbody>
</table>
Four Components, continued

Component 3: Methods
Four Components, continued

- Listen to the audio of Mr. Hill talking about expanding traditional lesson planning at http://mast.ecu.edu/modules/udl_hslp/lib/media/audio/Audio10-Mike3a.mp3
- Then listen to what Ms. Parks has to say about evidence-based methods at http://mast.ecu.edu/modules/udl_hslp/lib/media/audio11-Debbie3b.mp3; explore the examples.
Evidence-based methods

• Use the procedures of a direct instruction lesson in planning. These provide the structure needed for all learners and also allow for extensions for students who can work more independently or need more supports.

• When considering methods, look for evidenced-based methods that best support our learner needs.
Four Components, continued

• Consider the multiple intelligences and learning preferences.
• The 3 principles of UDL-multiple means of representation, engagement, and expression are now applied while planning the actual lesson.
Four Components, continued

• Some often-used methods or practices:
  – advance organizers,
  – graphic organizers,
  – modeling,
  – thinking aloud,
  – learning strategies instruction,
  – manipulative/multisensory strategies,
  – cooperative learning,
  – self-monitoring strategies,
  – peer buddies or tutors
Four Components, continued

– Some students also benefit from cueing and prompting systems.
– Look at the following examples of evidence-based methods:
Four Components, continued

• Advance organizers
  http://mast.ecu.edu/modules/udl_hslp/lib/images/advance_organizer1.jpg

• Graphic organizers
  http://mast.ecu.edu/modules/udl_hslp/lib/images/Thinking_Map.jpg

• Modeling- video at
  http://mast.ecu.edu/modules/udl_hslp/lib/media/one_solution.html
Four Components, continued

- Mnemonics
  http://www.coe.uga.edu/jolle/2010_1/Benge_mneumonics.pdf

- Songs/Raps for Memory- video at
  http://core.ecu.edu/umc/videos/easternkids.mp4
Four Components, continued

• Learning strategies instruction
  http://coe.jmu.edu/learningtoolbox/draw.html

• Manipulative strategies
  http://nlvm.usu.edu/en/nav/vlibrary.html

• Cooperative Learning/Peer Tutoring
  http://edtech.kennesaw.edu/intech/cooperativelearning.htm and
  http://www.k8accesscenter.org/training_resources/mathpeertutoring.asp
Four Components, continued

• Self-Monitoring Strategies

• Cues & Prompts
  http://mast.ecu.edu/modules/udl_hslp/lib/media/one_solution.html
Four Components, continued

Co-Teaching Methods

• Listen to the audio of Mr. Hill about thinking ahead and co-teaching at http://mast.ecu.edu/modules/udl_hslp/lib/media/audio/Audio12-Mike3c.
Four Components, continued

Use Co-Teaching to:
- Share in preparation and planning
- Divide up teaching tasks (technology, representation, engagement, assessment)
- Offer varied presentations
- Facilitate and monitor differentiated group work
- Brainstorm solutions!
Four Components, continued

Pyramid Planning

• When planning a unit or lesson, **pyramid planning** can help you think about how to differentiate instruction for your students.
Four Components, continued

• Sketch out a pyramid along with your lesson plan.
• First, think about what all students will accomplish. These go at the base of the pyramid since it is the broadest section.
Four Components, continued

– In science, for example, there may be some premade science experiments that all students can try that reinforce basic concepts being taught about plant parts and functions.
– Some students may quickly move on while others may need to continue working at this level for a variety of reasons.
Four Components, continued

– For example, some may need to gain proficiency with vocabulary, others may need to build their confidence with the subject/content/materials, while others may need to solidify knowledge of prerequisite skills.

– It is important to note here that higher level thinking skills can and should be incorporated at all levels.

– A student with autism, for example, might create a digital storyboard for the class on plant parts and functions.
Four Components, continued

• At the second level, think about what **most** students will be asked to do. The teacher might suggest a topic for further exploration at this stage.

What **most** students will do

What **all** students will do
Four Components, continued

• For example, students might be asked to investigate other types of plants and compare/contrast their findings to the plants that were studied by the whole group.

• Students are working at a middle to high level of learning but having the task generated for them helps them to get started and not waste valuable time wondering where to begin.
Four Components, continued

• At the top level, consider what a few students will do.
• These students likely need extensions for even greater challenge.
• These students may create his or her own experiment related to the topic and determine how data will be collected, displayed, analyzed, and evaluated.
Four Components, continued

- At the top level, consider what a **few** students will do.
Four Components, continued

• These students likely need extensions for even greater challenge.
• These students may create his or her own experiment related to the topic and determine how data will be collected, displayed, analyzed, and evaluated.
Accommodations vs. Modifications

Accommodations typically change the physical or sensory ways that students access information but they don’t change the curriculum.

Modifications typically change cognitive levels or the structure of the curriculum.

Source: Nolet & McLaughlin, 2005
Four Components, continued

• When planning for adaptations, it is important to differentiate between **accommodations** and **modifications**.
  
  – *Accommodations* generally change the physical or sensory ways that students access information but don't change the curriculum.
  
  – For example, a student with a hearing impairment is seated in the front of the room or a student who is visually impaired accesses an audio recording a lecture for review.
Four Components, continued

– *Modifications* typically change the cognitive level or the structure of the curriculum.

– Students can be working on the same topic but some may be working on only one type of problem while others are working on multiple types of problems.

– Perhaps there are adjustments for reading levels. Some students who have reading disabilities, for example, may access print at a lower reading level or have text read aloud.
Four Components, continued

- It is important to only use modifications when absolutely necessary because they may change the expectations of the curricular goals for students.
- On the flip side, for students who require modifications to participate in the general curriculum, they allow them to have access to the same big ideas and topics as everyone else.
Four Components, continued

• Universal Design for Learning helps us plan for flexibility in offering choices for adaptations from the start.

• The better teachers know their students and the curriculum, the better they can plan for their needs and capitalize on their strengths.

• As teachers are more collaborative with other faculty/staff/community partners, the options continue to multiply.
Four Components, continued

Component 4: Materials and Resources
### Four Components, continued

<table>
<thead>
<tr>
<th>High-Tech</th>
<th>Low-Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital text, eBooks, WebQuests, videos with</td>
<td>Textbooks, print materials, dictionaries, translators</td>
</tr>
<tr>
<td>closed caption, electronic translations</td>
<td></td>
</tr>
<tr>
<td>Multimedia presentation, podcast</td>
<td>Speech, lecture, interview</td>
</tr>
<tr>
<td>Graphing calculators, Geometer’s Sketchpad,</td>
<td>Graph paper, geoboards/rubber bands, pegboards</td>
</tr>
<tr>
<td>Excel spreadsheets</td>
<td></td>
</tr>
<tr>
<td>Virtual manipulatives, GPS devices, talking</td>
<td>Tiles, geoboards, base ten blocks, compasses, braille measuring tools</td>
</tr>
<tr>
<td>rulers</td>
<td></td>
</tr>
<tr>
<td>Virtual simulations</td>
<td>Role play, demonstration</td>
</tr>
<tr>
<td>Word processing, note-taking pen, audio</td>
<td>Folded paper, notebooks</td>
</tr>
<tr>
<td>recording, MP3 player/iPod</td>
<td></td>
</tr>
<tr>
<td>Classroom response system, electronic games</td>
<td>Response cards, scavenger hunt review</td>
</tr>
<tr>
<td>for review</td>
<td></td>
</tr>
</tbody>
</table>
Four Components, continued

- Remember technology tools and collaborative teaching can increase the flexibility of UDL environments as teachers make adjustments to meet the needs of diverse learners.
- Revisit the Introductory UDL module at http://mast.ecu.edu/modules/udl_intro for examples of low- and high-tech materials.
Activity – Four Components

• In pairs, draft a lesson around a big idea for a curricular area with which you are most familiar. Include ideas all four components (goals, assessment, method, & materials/resources).

• Focus on realistic goals and approaches, using resources typically available to you. Once lessons are drafted, report to the larger group for feedback.
UDL Lesson Plan- Academic, Social and Physical Barriers

• In planning a UDL lesson, think about the learning barriers students in your classroom may present in accessing the curriculum.
Lesson Plan- Barriers, continued

- Consider three aspects of learning:
  1) academic,
  2) physical or sensory,
  3) social/emotional
An example of an academic barrier might be students who lack background knowledge or vocabulary.

Some solutions might be having a ‘mini-lesson’ in a small group, an interactive computer program or video to review the information.

Vocabulary could be pre-taught.
Lesson Plan- Barriers, continued

• Pictures, symbols, and definitions could be added to charts/word cards to help the student access them in the beginning.

• Some students have physical/sensory needs. A student with attention deficit may benefit from having a cushion on his/her seat, alternate seating, or from using a fidget object.
Lesson Plan- Barriers, continued

• A student with a hearing impairment will likely benefit from having the closed caption feature added to videos.

• Disruptive students can be a social/emotional barrier. Pre-planning solutions include using contingency management plans or contracts to shape behavior in addition to having a structured classroom management plan.
Lesson Plan- Barriers, continued

• Offering these options for learning not only helps the students who specifically need an adaptation for access but also provides multiple options that can support other students.
Lesson Plan- Barriers, continued

• Slides concerning barriers follow and are available at
  http://mast.ecu.edu/modules/udl_hslp/lib/media/slides06/SlideShow.html
Academic, Physical, Social Barriers
Introduction

• In planning an UDL lesson, think about the learning barriers students in your classroom may present so you can brainstorm curricular solutions right away.

• Think about three aspects of learning:
  • Academic
  • Physical/Sensory
  • Social/Emotional
## Academic Considerations

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Possible Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of background knowledge</td>
<td>Pre-teach information that will help ‘set the stage’</td>
</tr>
<tr>
<td>Language/Vocabulary</td>
<td>Pre-teach vocabulary, add pictures/symbols, translations, definitions</td>
</tr>
<tr>
<td>Processing information/cognition</td>
<td>Learning Strategies instruction. Modeling, Direct instruction, ‘Hands on’/manipulatives</td>
</tr>
<tr>
<td>Organization</td>
<td>Advance organizers, graphic organizers</td>
</tr>
<tr>
<td>Reading/decoding</td>
<td>Digital text, read aloud, various reading levels of same material</td>
</tr>
<tr>
<td>Attention</td>
<td>Consider pace, novelty, structure, cues/prompts</td>
</tr>
<tr>
<td>Memory</td>
<td>Mnemonics, songs, keywords</td>
</tr>
<tr>
<td>Making generalizations</td>
<td>Provide community-based learning; provide purposeful/strategic interdisciplinary connections</td>
</tr>
</tbody>
</table>
# Physical/Sensory Considerations

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Possible Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses wheelchair</td>
<td>Make movement spaces wider; lower tables/desks as needed; make materials accessible/within reach</td>
</tr>
<tr>
<td>Accessing technology</td>
<td>Enlarged keyboard, activation switches, other assistive technologies</td>
</tr>
<tr>
<td>Hearing impairment</td>
<td>Use amplification device; closed caption feature on TV</td>
</tr>
<tr>
<td>Low vision</td>
<td>Use magnification/projection devices</td>
</tr>
<tr>
<td>Need movement</td>
<td>Allow student to stand, build movement into lesson</td>
</tr>
<tr>
<td>Attention</td>
<td>Allow fidgets, seat cushions</td>
</tr>
<tr>
<td>Vision, hearing, other physical challenge</td>
<td>Peer Assistance; consider safety</td>
</tr>
</tbody>
</table>
# Social/Emotional Considerations

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Possible Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staying on task</td>
<td>Self-monitoring, using signals/prompts</td>
</tr>
<tr>
<td>Working with others</td>
<td>Working alone, using study carrel; arrange compatible working partner(s)</td>
</tr>
<tr>
<td>Lack of confidence</td>
<td>Increased opportunities for success and positive feedback</td>
</tr>
<tr>
<td>Motivation</td>
<td>Add novelty, statement of purpose/goals, rewards</td>
</tr>
<tr>
<td>Disruptive</td>
<td>Use of contracts, contingency management systems</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>Small group work, purposeful grouping</td>
</tr>
<tr>
<td>Inappropriate behavior</td>
<td>Positive Reinforcement, consistent rule enforcement</td>
</tr>
<tr>
<td>Boredom</td>
<td>Link to student interests; Curriculum compacting, acceleration</td>
</tr>
</tbody>
</table>
UDL Lesson Plan - Preplanning Guide

• Listen to the audio about pre-planning at
  http://mast.ecu.edu/modules/udl_hslp/lib/media/audio/Audio16-Debbie5a.mp3
Planning for Universally Designed Instruction

Teacher(s): ____________________________ Date(s): ____________________________
Grade Level: ___________ Period/Class/Hour: ____________________________
Objectives: ____________________________________________________________
Subject: ______________________________________________________________
Total # of Students: ___________ Topic: ____________________________
Lesson Activities: ______________________________________________________
Assessment: __________________________________________________________

Students Needing Extra Supports
Adaptations/Modifications: (add student initials*):
IEPs _________________________________________________________________
Section 504 __________________________________________________________
BIPs _________________________________________________________________
Language _____________________________________________________________
Other needs/challenges: _______________________________________________

Students Needing Enrichment
Extensions/Challenges (add student initials*):
Notes: ______________________________________________________________

Source(s) for digital/scaffolded text for this unit: __________________________
Computer lab needs/schedule __________________________________________
Other Resources needed: _____________________________________________
Grouping Students: Large group: _______________________________________
Small group: _________________________________________________________
Individual: __________________________________________________________

*for confidentiality

Source: Adapted from: Patricia Hubbard  District website: http://www.livingston.kyschools.us
Special Education Technology Consultant/Web Design Specialist and CAST at www.cast.org
Lesson Plan-Preplanning, continued

• Here is a blank UDL lesson planning template. Mr. Hill and Ms. Parks will be demonstrating how they use it.
• We won't be able to show you all the details on each slide but you will be able to view our complete sample plan at the end of this section.
### UDL Lesson Plan Template

**Instructor:**

**Subject:**

<table>
<thead>
<tr>
<th>Lesson Objective(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment/s:</td>
</tr>
<tr>
<td>State Standards Correlation:</td>
</tr>
<tr>
<td>Materials/Resources:</td>
</tr>
<tr>
<td>Preplanning Activities:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lesson Element</th>
<th>Procedure for Teacher</th>
<th>Potential Barriers for Learning:</th>
<th>UDL Multiple Means of...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson Opening</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Input</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Guided Practice</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Independent Practice</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Closure</td>
<td></td>
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</tr>
</tbody>
</table>

#### Level 1: All students will:

#### Level II: Most students will:

#### Level III: Some students will...
Lesson Plan- Preplanning, continued

• Now, let's look at an excerpt from their actual lesson pre-planning activities:

Pre-Planning Activities:

• Prepare new vocabulary words and add symbolic representation/example/visualization (if there is a co-teacher, pre-teach vocabulary before class begins)
• Download free graph paper from: http://mathbits.com/mathbits/studentresources/graphpaper/graphpaper.htm
• Prepare class advance organizer and some individual ones.
• Have self-monitoring sheets ready for students who need them.
• Determine how students will be paired or grouped and who needs to sit near the front of the room.
Lesson Plan- Preplanning, continued

• We will demonstrate how we use a UDL lesson planning template as we plan our lesson on teaching our students how to use GPS systems using coordinate grids.

• Note how we brainstorm possible learning barriers and pair these with possible UDL solutions.
Lesson Plan - Preplanning, continued

- Let’s begin by looking at some of the pre-planning activities for our GPS lesson. The more planning we do ‘up front’, the better the lesson.
- Mr. Smith, our paraprofessional, and our intern divide up these tasks.
- We already have a lot of this done since it has been part of our larger unit on systems.
Lesson Plan - Preplanning, continued

• We had to practice ourselves with the GPS tools to really get a good idea of what we needed.

• Materials help make the concept as concrete as possible.

<table>
<thead>
<tr>
<th>MATERIALS:</th>
<th>RESOURCES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handheld compasses, GPS units (12),</td>
<td>Video Streaming Websites</td>
</tr>
<tr>
<td>colored tape, 3 satellite models,</td>
<td>WebQuests for research</td>
</tr>
<tr>
<td>colored yarn, clipboards, bucket</td>
<td>On-line print and media resources</td>
</tr>
<tr>
<td>with waypoints, vocabulary cards,</td>
<td>Links to mnemonic/song/rap on-line</td>
</tr>
<tr>
<td>materials for satellite construction</td>
<td>(<a href="http://www.songsforteaching.com">www.songsforteaching.com</a>)</td>
</tr>
<tr>
<td>(boxes, foil, jar lids, sticks, etc.),</td>
<td></td>
</tr>
<tr>
<td>clipboards, Cache surprise (sharks</td>
<td></td>
</tr>
<tr>
<td>teeth, ‘gems’)]</td>
<td></td>
</tr>
</tbody>
</table>
Lesson Plan- Preplanning, continued

• The team is planning to teach graphing systems of equations in this lesson.
  – Some of the students struggle with vocabulary.
  – Some struggle with organizing their thinking so an **advance organizer**, agenda, or outline to set the plan for the day is always provided.
  – This is prepared and posted it in the classroom.
Lesson Plan- Preplanning, continued

– Some individual copies are available for those who need them. Some students have self-monitoring sheets so those are also ready.

– Graph paper can be downloaded to be available for students.

– The team talks frequently about how they will group students. Mixing up the groupings up a bit depending on skill levels, language, interests, strengths and needs, and personalities.
Lesson Plan- Preplanning, continued

Advance Organizer

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Review vocabulary</td>
</tr>
<tr>
<td>2</td>
<td>Demonstration activity with ‘foldable’ for note-taking</td>
</tr>
<tr>
<td>3</td>
<td>Practice putting equations in slope-intercept form</td>
</tr>
<tr>
<td>4</td>
<td>Graph using table</td>
</tr>
<tr>
<td>5</td>
<td>Solve problems on your own and share results</td>
</tr>
</tbody>
</table>
Lesson Plan- Preplanning, continued

• Mr. Hill always has his content planned out so when meeting they are ready to brainstorm adaptations and divide up responsibilities.

• Sometimes Ms. Parks has to review the math with him herself because she works in several content areas.

• She helps him 'translate' the big ideas and skills for these diverse learners.
Lesson Plan- Preplanning, continued

• Let's take a look at their actual plan with the UDL adaptations they've been brainstorming.
• Note how they take the learner needs and consider UDL applications in this planning stage. They have color-coded the UDL principles to be sure they have covered all of our bases.
UDL Lesson Plan- Components

- The components of a lesson plan follow or watch and listen to the slide show at http://mast.ecu.edu/modules/udl_hslp/lib/media/slides07/SlideShow.html
# Lesson Opening

<table>
<thead>
<tr>
<th>Lesson Opening</th>
<th>Possible Learning Barriers</th>
<th>UDL Solutions</th>
</tr>
</thead>
</table>
| Hook: Play Linear Equation song for review and to energize class. | Attending  
Focusing  
Motivation  
Making connections to real life  
Students need more structure and a clear sense of purpose  
Organization | Use an auditory signal like a timer or bell to gain attention if you don’t use the song  
Relate to a topic/current event they are interested  
Post objective and advance organizer in room.  
Review both, along with rules and procedures.  
Refer to throughout lesson as needed (verbally or by pointing).  
Have individual copies available as needed. |
| Relate lesson to a road trip example and pose a question | | |
| **Objective:** Today I will show you how you can look at a pair of linear equations and tell what kind of solution to expect.  
Review our advance organizer and our rules and procedures. | | |
Thinking Aloud
Foldable Graphic Organizer

No Solution  One Solution  Infinitely Many Solutions
<table>
<thead>
<tr>
<th>Teacher Input</th>
<th>Possible Learner Barriers</th>
<th>UDL Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore the idea that there are only three possible relationships between a pair of linear equations when graphed on the same set of axes:</td>
<td>Auditory/Visual Processing Comprehension</td>
<td><strong>Representation</strong> Use 2 “uncooked” pieces of spaghetti or 2 “pick up” sticks to demonstrate with students. Students drop them on the overhead. Teacher and students will consider the possible arrangement of the lines by ‘thinking aloud’</td>
</tr>
<tr>
<td>Possible arrangements of the lines with descriptions of pairs of equations (systems of equations): Lines intersect at any angle (not just right angles) showing the system of equation is <strong>consistent</strong> and <strong>independent</strong></td>
<td>Note-taking, language</td>
<td><strong>Expression</strong> Co-teacher writes and draws example of the 3 possible arrangements on chart paper posted for all to see. Boldface or highlight vocabulary/key terms.</td>
</tr>
<tr>
<td>2) Lines are parallel and the system is <strong>inconsistent</strong></td>
<td>Writing</td>
<td><strong>Engagement</strong> Students complete a three part ‘foldable’ possible solutions</td>
</tr>
<tr>
<td>3) Lines coincide and the system is consistent and dependent</td>
<td>Low vision</td>
<td></td>
</tr>
<tr>
<td><strong>Now</strong> discuss the possible solutions:</td>
<td>Language</td>
<td></td>
</tr>
<tr>
<td>• One solution</td>
<td>Pair ELL student with peer who can help with translations</td>
<td></td>
</tr>
<tr>
<td>• No solution</td>
<td>Explain and show ‘coincide’ (one line lies on top the other)</td>
<td></td>
</tr>
<tr>
<td>Infinitely many solutions</td>
<td>Organization Sequencing</td>
<td>Number steps, and use transitional words when presenting information</td>
</tr>
</tbody>
</table>
## Guided Practice

<table>
<thead>
<tr>
<th>Guided Practice</th>
<th>Possible Learning Barriers</th>
<th>UDL Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher provides examples of equations and leads students: Students practice putting equations of lines in slope-intercept form by solving for $y$. Students will identify the slope and $y$-intercept of each line. Students will graph pairs of equations using a table Students will determine solutions</td>
<td>Focusing Attending to new material Staying in seat, need movement Memory Low vision Self-confidence</td>
<td>Students can practice with teacher or peer on a large floor grid (with large dots, ribbon, or string) or with geoboards with rubber bands, whiteboards or graphing calculators. Students refer to posted descriptions of possible solutions or to their own notes Work with peer who articulates process using geoboard Acknowledge positive behavior and correct attempts</td>
</tr>
</tbody>
</table>
Guided Practice
# Independent Practice

<table>
<thead>
<tr>
<th>Independent Practice</th>
<th>Possible Learning Barriers</th>
<th>UDL Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will graph different systems of equations and determine whether each system has no solution, one solution, or infinitely many solutions.</td>
<td>Working Independently Comprehension</td>
<td>Students may use self-monitoring checklist if needed. May work with partner or on computer with program that scaffolds this same instruction. Students have access to geoboards, floor grid, whiteboards, poster board, graphing calculators and computers.</td>
</tr>
<tr>
<td>Extension: Think of a real-world situation that could benefit from graphing systems of equations to make future predictions. What data would you need to consider? Include equations and graphs you develop possible solutions.</td>
<td>Confidence Motivation</td>
<td>Teacher circulates, questions, provides needed cues/prompts, and feedback.</td>
</tr>
<tr>
<td></td>
<td>Students need extra challenge</td>
<td>Provide tasks that require students to use their own thinking to create and solve a problem. Provide interactive CD from textbook to generate ideas if needed.</td>
</tr>
</tbody>
</table>
Independent Practice
## Closure

<table>
<thead>
<tr>
<th>Learning Barriers</th>
<th>UDL Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Representation</td>
<td>Sharing results</td>
</tr>
<tr>
<td>Expression</td>
<td>Thinking aloud</td>
</tr>
<tr>
<td>Engagement</td>
<td>Asking questions</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Let’s see what we found out.</th>
<th>Seeing patterns/drawing conclusions</th>
<th>Sharing results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Think back to the road trip</td>
<td>Relating back to road trip analogy in lesson opening</td>
<td>Thinking aloud</td>
</tr>
<tr>
<td>the idea that knowing this concept could help us in a road trip. Maybe it could help us make a choice between two types of cars we might want to drive to save the most money. What other real life examples can you think of?</td>
<td>Staying on task</td>
<td>Asking questions</td>
</tr>
<tr>
<td>In our next lesson we will...</td>
<td>Transferring learning</td>
<td>Relate learning to real life examples</td>
</tr>
<tr>
<td></td>
<td>Self-Confidence</td>
<td>Praising students for their findings and their ideas</td>
</tr>
<tr>
<td></td>
<td>Transitioning to new learning</td>
<td>Previewing the next lesson</td>
</tr>
</tbody>
</table>
Lesson Plan-Putting It All Together

• Look at Mr. Hill and Ms. Parks’ entire lesson plan at http://mast.ecu.edu/modules/udl_hslp/lib/documents/Entire_Lesson_Plan.pdf; see how it looks when put together.

• It has more details and examples than we have covered, including pyramid planning.
Lesson Plan-Putting It All Together, continued

• Access video clips of Mr. Hill's adaptations for teaching these algebraic concepts using the large pegboard, pegs, and dowels:

• One solution: 
  http://mast.ecu.edu/modules/udl_hslp/lib/media/one_solution.html
Lesson Plan-Putting It All Together, continued

- No solutions:  
  http://mast.ecu.edu/modules/udl_hslp/lib/media/No_solutions.html

- Many solutions:  
  http://mast.ecu.edu/modules/udl_hslp/lib/media/many_solutions.html

Note: If teachers routinely record their presentations in this manner, the information can be available for students who need multiple repetitions, were absent, or need to work from another location. Some students may also make these kinds of recordings as extension challenges.
Lesson Plan-Putting It All Together, continued

• From planning with goals, assessment, methods, and materials from the start, they have increased the opportunities for students in their classroom to successfully access the curriculum in algebra.

• The options provided for students with special needs should actually help even more learners access math content.
Lesson Plan-Putting It All Together, continued

• This has been a math example, but the process is the same for all content areas.
  – A blank UDL pre-planning template can be downloaded at
  – A blank UDL lesson planning template can be downloaded at
Activity- UDL Lesson Plan


• Each small group is assigned a phase of UDL lesson planning:
  – preplanning, advance organizer, lesson opening, teacher input, guided practice, independent practice, closure.
Activity - Lesson Plan, continued

- Reflect on how each phase is addressed, and if and how UDL components are addressed.
- In order of the lesson plan components, small groups report back to large group sequentially.
Focus and Reflection Questions

1. Why is it so important to begin planning with the big ideas, a standards-based focus, and accessible goals?

2. Provide examples of lesson objectives or goals that are *not* accessible and reconstruct them so that they provide greater access for all learners. Consider representation, engagement, and expression as you do this.
Focus and Reflection Questions, continued

3. Should teachers offer as many accommodations and/or modifications as possible to students with disabilities in the regular classroom? Why or why not? Defend your answer.

4. Can strategic integration of goals apply across discipline areas and grade levels? Explain your answer.
Focus and Reflection Questions, continued

5. Some researchers believe collaborative planning and problem solving will be key to the success of UDL. Do you agree or disagree?

6. How might a pyramid planning graphic organizer help a teacher differentiate instruction as well as support the principles of UDL?
Application and Extension Activities

1. Go to *UDL Editions by CAST* ([http://udleditions.cast.org/](http://udleditions.cast.org/)) and select a story to read. Use the different Text Help features and explore the Strategy Support, Author’s Craft, the Glossary, and Resources tabs. Apply the three different levels of support as you go through the pages. Describe your findings and reflect on how these features could benefit students you teach or are preparing to teach.
2. Research six or more technologies that can help students access the curriculum. Create a matrix to describe and brainstorm possible UDL lesson planning applications of these technologies using the following template. Choose technologies that represent academic, environmental and social applications as well as the three principles of UDL. What are the benefits of each?
<table>
<thead>
<tr>
<th>Technology Tool</th>
<th>Brief Description</th>
<th>Academic Environmental Social (Which type?)</th>
<th>Possible UDL Lesson Plan Applications (Representation, Engagement, Expression)</th>
<th>Benefits (Who may benefit and how?)</th>
</tr>
</thead>
<tbody>
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</table>
Application and Extension Activities, continued

3. Revisit the slide “Examples of Evidence-Based Methods” (page 17 of the Facilitator’s Guide). Divide up the methods by assigning groups. Have the groups follow the links provided and summarize the methods/strategies to present to the whole group.
4. Look over the ‘Diner Menu’ organizer below on Photosynthesis. Explain to students that all students share the ‘appetizer’ but they may choose an entree and sides. Dessert is optional. Have students use this organizer to plan another lesson that can offer flexible options. All students can reach the same outcome but get there in different ways. Have them bookmark this website for future reference (http://www.k8accesscenter.org).
Diner Menu – Photosynthesis

Appetizer (Everyone Shares)
- Write the chemical equation for photosynthesis

Entrée (Select One)
- Draw a picture that shows what happens during photosynthesis
- Write two paragraphs about what happens during photosynthesis
- Create a rap that explains what happens during photosynthesis
**Side Dishes (Select at Least Two)**

- Define respiration, in writing
- Compare photosynthesis to respiration using a Venn Diagram
- Write a journal entry from the point of view of a green plant
- With a partner, create and perform a skit that shows the differences between photosynthesis and respiration

**Dessert (Optional)**

- Create a test to assess the teacher’s knowledge of photosynthesis

Self-Assessment

• A self-assessment with response feedback is available at http://mast.ecu.edu/modules/udl_hslp/quiz/. Participants may take this assessment online to evaluate their learning about content presented in this module.
Session Evaluation

• A form for participants to evaluate the session is available in the Facilitator’s Guide.