

# Using Artificial Intelligence (AI) to Create Universal Design for Learning (UDL) Choice Boards

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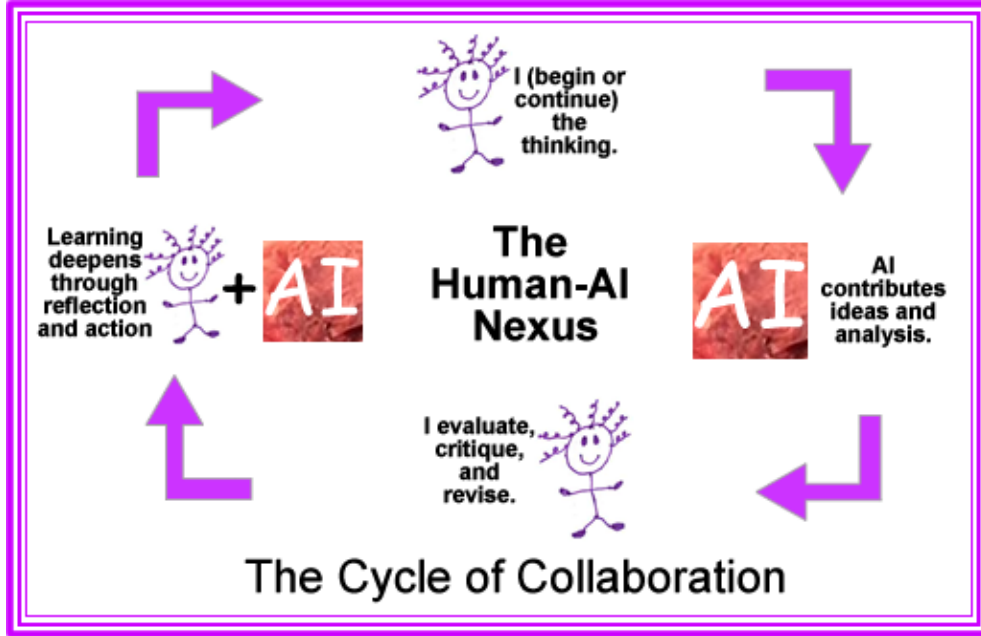
My goal when creating a choice board is to elevate student thinking. Choice boards are also helpful to differentiate learning at various academic levels in the general education classroom.

When I use AI to create a choice board, I want to keep in mind what AI does well and what the human (me) needs to add to the partnership. The information in the chart below clarifies the areas where AI excels and where the human half of the partnership needs to be added into the process.

<p style="text-align: center;"><b>Remember (Knowledge)</b>  <small>NAME MATCH RECALL ENUMERATE DEFINE            LABEL LIST STATE RETRIEVE DEFINE QUOTE</small></p> <p style="text-align: center;">AI is most efficient at this level, acting as a massive, searchable repository of human knowledge.</p> <p style="text-align: center;"><i>The Human has the connection:            Deep personal memory and lived experience</i></p>	<p style="text-align: center;"><b>Analyze (Analysis)</b>  <small>DECONSTRUCT ORGANIZE DISSECT CATEGORIZE            IDENTIFY OUTLINE DISCRIMINATE COMPARE</small></p> <p style="text-align: center;">AI can identify patterns, break down structures, and distinguish between different parts of a whole.</p> <p style="text-align: center;"><i>The Human has the soul:            Intuition and "reading between the lines."</i></p>
<p style="text-align: center;"><b>Understand (Comprehension)</b>  <small>SUMMARIZE PARAPHRASE INTERPRET EXPLAIN            CLASSIFY TRANSLATE DESCRIBE DISCUSS</small></p> <p style="text-align: center;">AI can process context and rephrase information to help clarify concepts.</p> <p style="text-align: center;"><i>The Human has the nuance:            Emotional and moral context.</i></p>	<p style="text-align: center;"><b>Evaluate (Evaluation)</b>  <small>GRADE APPRAISE JUDGE RATE VALIDATE            DEFEND CRITIQUE JUSTIFY VERIFY FACT-CHECK</small></p> <p style="text-align: center;">AI can check for consistency, verify facts against training data, &amp; critiques based on provided rubrics</p> <p style="text-align: center;"><i>The Human has the agency:            Ethical reasoning and subjective judgment</i></p>
<p style="text-align: center;"><b>Apply (Application)</b>  <small>USE SOLVE DEMONSTRATE IMPLEMENT            COMPUTE CONSTRUCT CHANGE SEQUENCE EXECUTE</small></p> <p style="text-align: center;">AI can use learned rules or procedures to solve specific problems in new contexts.</p> <p style="text-align: center;"><i>The Human has the real world expertise:            Physical application in the real world.</i></p>	<p style="text-align: center;"><b>Create (Synthesis)</b>  <small>PROPOSE REMIX DESIGN PLAN GENERATE            WRITE FORMULATE COMPOSE DEVELOP PROTOTYPE</small></p> <p style="text-align: center;">Modern Generative AI has moved this from a "human-only" level to one of its strongest capabilities</p> <p style="text-align: center;"><i>The Human knows the true motive: True original innovation and intentionality.</i></p>

The following details how I analyzed the activities generated by AI and refined them to make them appropriate for my students using the "Human-AI Nexus: The Cycle of Collaboration".

*Note: The large language AI models I used here are the latest free versions available through Google (Gemini), OpenAI (ChatGPT), and Canva. I selected them for this exercise because they are the ones available to me on my school district network. The Cycle of Collaboration, however, can be implemented using your favorite AI app.*



**First, I begin the thinking.**

The following standard is not covered in our district provided curriculum, so I wanted to use a choice board design for students to engage with the content.

Arizona Science Standards

**Earth and Space Sciences:** Students develop an understanding of the distribution and role of water and wind in weather, shaping the land, and where organisms live. Wind and water can also change environments, and students learn humans and other organisms can change environments too. Students develop an understanding of changing patterns in the sky including the position of Sun, Moon, and stars, and the apparent shape of the Moon.

2.E2U1.8	Crosscutting Concepts & Background Information for Educators
<p><b>Observe and explain</b> the Sun’s position at different times during a twenty-four-hour period and changes in the apparent shape of the Moon from one night to another.</p>	<p><b>Crosscutting Concepts:</b> Patterns; Cause and Effect; Scale, Proportion and Quantity; <b>Systems and System Models</b>; <b>Energy and Matter</b>; Structure and Function; Stability and Change<sup>4</sup></p> <p><b>Background Information:</b> There are patterns in the position of the <b>Sun</b> seen at different times of the <b>day</b> and in the shape of the <b>Moon</b> from one <b>night</b> to another.<sup>2</sup>(p. 25) Seasonal patterns of sunrise and sunset can be observed, described, and predicted. <sup>4</sup>(p. 176)</p>

This 2.E2U1.8 standard is a basic and narrow concept looking at the changing pattern of the sun and the moon in the sky. I can easily expand on this content using AI’s help.

Our science and reading curricula cover the content laid out in the first sentences of the overarching explanation about the role of water and wind in weather, shaping the land,

and where organisms live. Also, Unit 8 of the district curriculum covers how wind and water change environments and how humans and other organisms can change environments, too. But it does not cover the changing patterns of the Sun, Moon and stars in the sky.

From there I decided that it would be best to start with the sun's pattern, because it will be easier for my students to see that pattern throughout the school day. I figured once students understand and are interested in how the sun appears to change throughout the day, I can then ask them to extend their knowledge and observe the moon in the evening on their own or with their family.

Finally, I crossed out the AZ Science Standards information (general information, standard verbiage, and background information) and crosscutting concepts that do not apply to the sun.

*Earth and Space Sciences: ~~(1) Students develop an understanding of the distribution and role of water and wind in weather, shaping the land, and where organisms live. (2) Wind and water can also change environments, and students learn humans and other organisms can change environments too. (3) Students develop an understanding of changing patterns in the sky including the position of Sun, Moon, and stars, and the apparent shape of the Moon.~~*

*2.E2U1.8 [Observe and explain](#) the Sun's position at different times during a twenty-four-hour period ~~and changes in the apparent shape of the Moon from one night to another.~~*

*Background Information:*

*There are patterns in the position of the Sun seen at different times of the day ~~and in the shape of the Moon from one night to another.~~ Seasonal patterns of sunrise and sunset can be observed, described, and predicted.*

*Crosscutting Concepts:*

*Patterns; Cause and Effect; Scale, Proportion and Quantity; Systems and System Models; Energy and Matter; Structure and Function; Stability and Change*

### **Next, I asked AI for ideas and analysis.**

Here is the prompt I entered into Google's Gemini:

*Provide a choice board of possible products that can help 2<sup>nd</sup> graders demonstrate they have learned the following information: Students develop an understanding of changing patterns in the sky including the position of the Sun. There are patterns in the position of the Sun seen at different times of the day. Seasonal patterns of sunrise and sunset can be observed, described, and predicted. Include these crosscutting concepts: Patterns; Cause and Effect; Scale, Proportion and Quantity; Systems and System Models; Energy and Matter; Structure and Function; Stability and Change. Include activities that follow bloom's taxonomy: remember, understand, apply, analyze, evaluate, create.*

**AI Response:**

To help 2nd graders demonstrate their mastery of solar patterns, here is a **\*\*Choice Board\*\*** of final products. These activities allow students to show what they know through different mediums while hitting all required **\*\*Crosscutting Concepts (CCCs)\*\*** and **\*\*Bloom's Taxonomy\*\*** levels.

<b>Bloom's Level</b>	<b>Product Activity</b>	<b>Crosscutting Concept (CCC)</b>
<b>Remember</b>	<b>The "Sun's Path" Picture Dictionary:</b> Create a visual glossary of terms like sunrise, sunset, horizon, and shadow. Draw a picture for each to show where the Sun is.	<b>Patterns:</b> Recognizing the repeating positions of the Sun.
<b>Understand</b>	<b>Narrated Puppet Show:</b> Use a "Sun" on a stick and a "Home" cutout. Film a short video explaining why shadows are long in the morning and short at noon.	<b>Systems and System Models:</b> Using objects to represent the Sun-Earth relationship.
<b>Apply</b>	<b>The Shadow Architect:</b> Build a LEGO or cardboard playground. Use a flashlight to show where the "shady spots" will be at 10 AM vs 2 PM so kids don't get too hot.	<b>Structure and Function:</b> Designing a space based on how the Sun moves.
<b>Analyze</b>	<b>Seasonal Detective Report:</b> Look at a "Mystery Calendar" showing sunrise times for Summer and Winter. Write a report explaining why we have more time to play outside in July than in December.	<b>Scale, Proportion, and Quantity:</b> Comparing lengths of time and daylight.
<b>Evaluate</b>	<b>The "Solar Power" Debate:</b> Does a solar-powered toy work better in the morning, noon, or evening? Test this and write an "Expert Opinion" on the best time to charge it.	<b>Energy and Matter:</b> Tracking how the Sun's energy changes throughout the day.

<b>Create</b>	<b>A Sky-Watcher's Guide to 2027:</b> Design a "Prediction Map" for a future month. Draw where the Sun will rise and set, and predict if the days will be getting longer or shorter.	<b>Stability and Change:</b> Predicting future changes in a stable, repeating cycle.
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**Now, I evaluate, critique and revise AI's ideas.**

I will now check each suggested activity for its appropriateness for my students, whether my classroom has the supplies to complete the activity, and to make sure that each activity accounts for the human characteristic AI is lacking.

**BLOOM'S: REMEMBER**

<b>Remember</b>	<b>The "Sun's Path" Picture Dictionary:</b> Create a visual glossary of terms like sunrise, sunset, horizon, and shadow. Draw a picture for each to show where the Sun is.	<b>Patterns:</b> Recognizing the repeating positions of the Sun.
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*My Evaluation, Critique and Revision: Ask Myself*

Is this appropriate for my students and relevant to my target?	YES
Can students complete this task independently?	YES
Do I have the materials available in class for this activity?	YES
Does this activity provide for AI's weakness (a connection or deep personal memory and lived experience)?	NO

This is a good start for my students, but I need to add something that will help them connect to their own personal memory or lived experience. My kids know this skill as a Text-to-Self Connection. I am going to make a graphic organizer for them to fill out for each word which includes a personal connection. The graphic organizer will also support my English Language Learners and students who have a language disability. I am also going to add a few more options for vocabulary words based on what we talked about, observed, and researched as a whole group activity in our classroom: earth's axis, spin, sun, day, sun's daily pattern. I used Canva's AI to create the following:

## Daily Sun Pattern Vocabulary

<p style="text-align: center; font-size: small;">WORD OR CONCEPT</p>	<p style="text-align: center; font-size: small;">WHAT IT MEANS</p>
<p style="text-align: center; font-size: small;">PICTURE ILLUSTRATION</p>	<p style="text-align: center; font-style: italic; font-weight: bold;">Text-to-Self Connection</p> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/>

### BLOOM'S: UNDERSTAND

<b>Understand</b>	<p><b>Narrated Puppet Show:</b> Use a "Sun" on a stick and a "Home" cutout. Film a short video explaining why shadows are long in the morning and short at noon.</p>	<p><b>Systems and System Models:</b> Using objects to represent the Sun-Earth relationship.</p>
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### *My Evaluation, Critique and Revision: Ask Myself*

Is this appropriate for my students and relevant to my target?	YES
Can students complete this task independently?	NO
Do I have the materials available in class for this activity?	NO
Does this activity provide for AI's weakness (nuance-emotional and moral context)?	NO

Filming in class will be too difficult for my students. **I am going to ask AI for more suggestions.** My prompt: *Students do not have a way to film, other ideas?*

This was my favorite:

<b>"Day in the Life" Comic</b>	Students create a 3-panel comic strip showing a character at 8:00 AM, 12:00 PM, and 6:00 PM. They must include the Sun's position and the character's shadow in each panel.	<b>Patterns:</b> Identifying the predictable sequence of the Sun's daily journey.
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*My Evaluation, Critique and Revision: Ask Myself*

Is this appropriate for my students and relevant to my target?	YES
Can they complete this task independently?	YES
Do I have the materials available in class for this activity?	YES
Does this activity provide for AI's weakness (nuance-emotional and moral context)?	NO

To add nuance to this activity, I will have students write how the character is feeling at each time of the day. For example: *the sun feels so good on my back, it makes me feel so relaxed.* Alternatively: *the sun is setting, I can feel the temperature dropping. I need my jacket.*

For students who are lower academically I can also provide a blank comic strip with the times and title on it.

**BLOOM'S: APPLY**

<b>Apply</b>	<b>The Shadow Architect:</b> Build a LEGO or cardboard playground. Use a flashlight to show where the "shady spots" will be at 10 AM vs 2 PM so kids don't get too hot.	<b>Structure and Function:</b> Designing a space based on how the Sun moves.
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*My Evaluation, Critique and Revision: Ask Myself*

Is this appropriate for my students and relevant to my target?	NO
Can they complete this task independently?	NO
Do I have the materials available in class for this activity?	NO
Does this activity provide for AI's weakness (real world expertise: physical application in the real world)?	N/A

**I am going to ask AI for more suggestions.** My prompt: *More options please.*

My favorite:

<b>Animal Habitat Helper</b>	Students choose an animal that likes the Sun (like a lizard) or dislikes it (like a frog). They must build a small habitat and show where the animal would move at 9:00 AM versus 4:00 PM to stay happy.	<b>Systems and System Models:</b> Modeling how a living thing interacts with the Sun-Earth system.
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*My Evaluation, Critique and Revision: Ask Myself*

Is this appropriate for my students and relevant to my target?	YES
Can they complete this task independently?	YES
Do I have the materials available in class for this activity?	YES
Does this activity provide for AI's weakness (real world expertise: physical application in the real world)?	YES

Finally, I will provide a checklist so students can use it as a guide for completing this task:

- My habitat includes the sun.
- My animal is in a different spot at 9:00 AM and 4:00 PM.
- The times are labeled.
- My habitat has food, water, and shelter for my animal.
- I can explain why the animal is happy where he is at both times of the day.

**BLOOM'S: ANALYZE**

<b>Analyze</b>	<b>Seasonal Detective Report:</b> Look at a "Mystery Calendar" showing sunrise times for Summer and Winter. Write a report explaining why we have more time to play outside in July than in December.	<b>Scale, Proportion, and Quantity:</b> Comparing lengths of time and daylight.
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*My Evaluation, Critique and Revision: Ask Myself*

Is this appropriate for my students and relevant to my target?	Maybe
Can they complete this task independently?	Maybe
Do I have the materials available in class for this activity?	YES

Does this activity provide for AI's weakness (soul: intuition and reading between the lines)?	N/A
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At the same time, I am not clear on exactly how this activity will work and the general statement, "writing a report" is too vague. **So I am going to ask AI for more suggestions.** My prompt: *More suggestions.*

My favorite:

<b>"Where in the World?" Photo Sort</b>	Provide photos of the same playground taken at 5:00 PM in June and 5:00 PM in December. Students must compare the light levels and explain which photo belongs to which season using evidence.	<b>Cause and Effect:</b> Linking the Earth's position in its orbit to the amount of light received.
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*My Evaluation, Critique and Revision: Ask Myself*

Is this appropriate for my students and relevant to my target?	YES
Can they complete this task independently?	YES
Do I have the materials available in class for this activity?	YES
Does this activity provide for AI's weakness (soul: intuition and reading between the lines)?	N/A

I can use AI to create these photos or take two pictures of something in the playground myself. I will provide a graphic organizer to go along with this activity as well so students can plan their explanation. The graphic organizer will ask:

- What do you notice for photo #1?
- What do you notice for photo #2?
- What do you know about the sun, the sky, and the seasons?
- Using what you know, which season is it in each of the photos?

**For students with language disabilities and ELLs, I will ask ChatGPT to provide a word bank for the graphic organizer.** My prompt: *Please create a word banks students can use to answer the following questions:*

- *What do you notice for photo #1?*
- *What do you notice for photo #2?*
- *What do you know about the sun, the sky, and the seasons?*
- *Using what you know, which season is it in each of the photos?*

AI response:

<p><b>Light &amp; Sky Words</b></p> <ul style="list-style-type: none"> <li>● bright</li> <li>● dark</li> <li>● light</li> <li>● sunlight</li> <li>● shadow</li> <li>● sky</li> <li>● blue sky</li> <li>● orange sky</li> <li>● sunset</li> <li>● cloudy</li> </ul> <p><b>Sun Words</b></p> <ul style="list-style-type: none"> <li>● sun</li> <li>● sunlight</li> <li>● sun is high</li> <li>● sun is low</li> <li>● sun is setting</li> <li>● sun in the sky</li> </ul> <p><b>Thinking / Explaining Words</b></p> <ul style="list-style-type: none"> <li>● I think</li> <li>● I know</li> <li>● because</li> <li>● so</li> <li>● this means</li> <li>● the evidence is</li> </ul>	<p><b>Time of Day</b></p> <ul style="list-style-type: none"> <li>● afternoon</li> <li>● evening</li> <li>● 5:00 PM</li> <li>● before sunset</li> <li>● after sunset</li> </ul> <p><b>Season Words</b></p> <ul style="list-style-type: none"> <li>● summer</li> <li>● winter</li> <li>● season</li> <li>● long day</li> <li>● short day</li> <li>● more daylight</li> <li>● less daylight</li> </ul> <p><b>Observation Words</b></p> <ul style="list-style-type: none"> <li>● I notice</li> <li>● I see</li> <li>● I observe</li> <li>● the picture shows</li> <li>● in photo #1</li> <li>● in photo #2</li> </ul>	<p><b>Sentence Frames</b></p> <p><b>Photo Observations</b></p> <ul style="list-style-type: none"> <li>● In photo #1, I notice _____.</li> <li>● In photo #2, I see _____.</li> <li>● The sky looks _____.</li> <li>● The playground is _____ (bright/dark).</li> </ul> <p><b>Sun and Seasons</b></p> <ul style="list-style-type: none"> <li>● I know the sun _____ (sets early/sets late) in _____.</li> <li>● In summer the days are _____ (long/short).</li> <li>● In winter the days are _____.</li> </ul> <p><b>Conclusion</b></p> <ul style="list-style-type: none"> <li>· Photo #1 is _____ because _____.</li> <li>· Photo #2 is _____ because _____.</li> </ul>
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**BLOOM'S: EVALUATE**

<p><b>Evaluate</b></p>	<p><b>The "Solar Power" Debate:</b> Does a solar-powered toy work better in the morning, noon, or evening? Test this and write an "Expert Opinion" on the best time to charge it.</p>	<p><b>Energy and Matter:</b> Tracking how the Sun's energy changes throughout the day.</p>
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*My Evaluation, Critique and Revision: Ask Myself*

<p>Is this appropriate for my students and relevant to my target?</p>	<p>YES</p>
<p>Can they complete this task independently?</p>	<p>Maybe</p>

Do I have the materials available in class for this activity?	No
Does this activity provide for AI's weakness (is this the true motive and have the intentionality of this standard)?	YES

I am going to ask AI for more suggestions. My prompt: *More ideas?*

My favorite:

<b>Shadow Truth or Myth?</b>	Give students a set of "claims" (e.g., "Shadows are shortest at breakfast time"). Students must perform a quick test or look at their previous data to decide if the claim is Truth or Myth, providing their evidence as the "judge."	<b>Patterns:</b> Using gathered evidence to verify or debunk statements about solar movement.
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*My Evaluation, Critique and Revision: Ask Myself*

Is this appropriate for my students and relevant to my target?	YES
Can they complete this task independently?	YES
Do I have the materials available in class for this activity?	YES
Does this activity provide for AI's weakness (is it the true intention of the standard)?	YES

AI-Generated Examples

Statement	Status	The Scientific "Proof" (Evidence)
<b>Shadows are the longest right at lunchtime (Noon).</b>	<b>MYTH</b>	At noon, the Sun is at its highest point. This makes shadows the <b>shortest</b> of the day, not the longest!
<b>The Sun always rises in the East and sets in the West.</b>	<b>TRUTH</b>	This is a stable pattern. Because the Earth always spins the same way, the Sun always appears to move in this direction.
<b>In the winter, the Sun stays in the sky for a shorter time.</b>	<b>TRUTH</b>	This is a <b>seasonal pattern</b> . We have fewer hours of daylight in winter, which is why it gets dark before dinner!
<b>Your shadow always stays the exact same size all day long.</b>	<b>MYTH</b>	As the Sun's position changes ( <b>cause</b> ), the shadow's length changes ( <b>effect</b> ).

		Shadows are long in the morning and short at noon.
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**Finally, I would ask Canva AI to (1) create a choice board for me using my finalized activities and (1) allow me to edit it in Canva and make copies of it for my students.**

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Using the Cycle of Collaboration to inform my AI use when planning a choice board yielded six solid activities for my students. Had I just cut/pasted AI's first suggestions, none of the activities would have met my expectations, and most of them would have only frustrated and discouraged my students. However, by questioning AI's results according to the needs of my students and then re-prompting the models, I was able to develop a set of appropriate and meaningful activities in rapid succession that will deepen my students' learning.

*For the blog post linked to this resource, please visit [here](#).*