3D L|A:
Learning Architecture Instructional Planning Tool

ASTE 2020

Nurtures

Introduction

- NURTURES, University of Toledo

  Teacher Professional Development
  +
  Family & Community Engagement

  Focus:

  - Early childhood science education
  - Inquiry-based learning
  - 3 Dimensions

- Who are you?

Session Goals

- Introduce L|A tools and process

- Apply L|A tools and process

- Reflections on experience

- Brainstorm for future implementation

Overview

- Process:
  - Condensed & scaffolded
  - Seeded with real teacher scenarios
  - End goal – unit outline and lesson ideas
- Materials:
  - Boards & sticky notes
  - Resource Packet
    - Teacher scenario
    - "Construction" materials
- Groups: A,B,C

Learning Architecture

The NURTURES Learning Architecture facilitates the development of robust learning plans comprised of a structured series of lessons integrating 3 dimensional learning for the early childhood classroom.
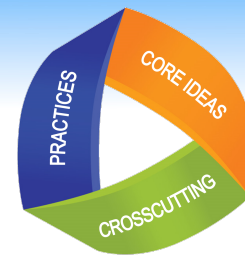
PRACTICES • CORE IDEAS • CROSSCUTTING

3D Specifications
Unpacking of NGSS elements that will support 3D learning throughout the developed unit

Learning Architecture: 3D Specifications

Performance Expectation Theme

Disciplinary Core Ideas (DCIs)	Science & Engineering Practices (SEPs)	Crosscutting Concepts (CCs)	Phenomena & Questions

Learning Performances

Learning Blueprint
Deep thinking on supporting 3D learning in context to relevant concepts and specifications

Learning Architecture: Learning Blueprint

Questions	Learning Performances	Tasks	Meaningful Learning Outcomes

Lesson Construction
Lesson plans with specific detail for practical application of learning blueprint structure

Unit:

Name(s): First Last
NAME:
GRADE: Target Grade Level:
DOMAIN: Domain(s):
NOTES: LEARNING PLAN:
    LESSON NAME:
STANDARDS   DURATION:
Performance Expectation (targeted by the end of the unit):
• *DCI(s)* targeted for this lesson:
• *SEP(s)* for this lesson:
• *CC(s)* targeted for this lesson:
LEARNING PERFORMANCE(S)
INSTRUCTIONAL SEQUENCE
Materials needed:
Instructional strategies:
Time required:
Cautions:
Introducing the Lesson:
Instructional Tactics:
DRIVING QUESTION
•
EVALUATION

Based on SLIDE lesson plan format used in Krajcik, J. and Czerniak,C.M. (2014). Teaching Science in Elementary and Middle School. New York: Routledge.

3 Dimensional Planning in Support of 3 Dimensional Learning

Group time!

3D Specifications

Unpacking of NGSS elements that will support 3D learning throughout the developed unit

NGSS
Next Generation Science Standards

Performance Expectations

"The NGSS is not a set of daily standards...the performance expectations set the learning goals for students, but do not describe how students get there." (NGSS, 2017)

Disciplinary Core Ideas (DCI)

"The fundamental ideas that are necessary for understanding a given science discipline." (NGSS, 2017)

Sci & Eng Practices (SEP)

"...behaviors that scientists engage in as they investigate and build models and theories ... and the key set of engineering practices that engineers use as they design and build models and systems." (NGSS, 2017)

Crosscutting Concepts (CC)

"...connections and intellectual tools that are related across the differing areas of disciplinary content and can enrich their application of practices and their understanding of core ideas." (Framework p. 233)

Learning Architecture: 3D Specifications

Performance Expectation Theme

| Disciplinary Core Ideas (DCIs)	Science & Engineering Practices (SEPs)	Crosscutting Concepts (CCs)	Phenomena & Questions

Learning Performances

Learning Performances

Brainstorm a set of *actions* students will take over the course of the unit that will facilitate their 3 dimensional learning.

Students *utilize a SEP* to experience *a relevant Phenomena* through *a specific CC* to learn key *Disciplinary Core Ideas.*

Teachers explore 3D elements and identify student-relevant phenomena and questions that support development of learning performances.
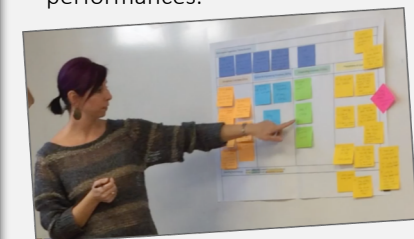
Phenomena & Questions

Brainstorm concepts that can be used to explore DCI topics. Suggest questions about these concepts that can frame more in-depth investigations in the context of SEPs and CCs that would be relevant to students.

Process: 3D Specifications

- We loaded the boards with PE/DCIs/SEPs/CCs, a few Phenomena & Questions, and Learning Performances

- We are asking you to add:

  + 2-3 Phenomena & Questions

  + 2-3 Learning Performances

Learning Blueprint

Deep thinking on supporting 3D learning in context to relevant concepts and specifications

Questions

Utilize the phenomena and question brainstorming from the 3D Specifications to select questions that will structure and motivate the advancement of 3D learning as the planned unit progresses.

Learning Performances

In the Learning Blueprint learning performances should be matched with the questions to drive the plan structure.

Students utilize a SEP to experience a relevant phenomena through a specific CC to learning key DCIs.

Learning Architecture: Learning Blueprint

Questions	Learning Performances	Tasks	Meaningful Learning Outcomes
Question: Are we having recess?	Students ask questions to understand the cause and effect of weather conditions on recess.	Recess experience Opening conversation Discuss: Temp, cloud, wind precip, What would we do...	Weather has parts and those parts impact daily activities
		Weather journals Observations of temperature clouds Wind Precipitation	Weather is comprised of several natural factors: Sunlight, Wind Precipitation, Temperature
			Weather breaks down into parts/ factors/ conditions and those parts have causes and effects
			These parts can be measured

Teachers refine and synthesize questions and learning performances. They create tasks and outcomes, supporting and assessing their intended 3D learning goals.

Tasks
in support of learning

Specific activities that achieve the learning performances will comprise the tasks involved to deliver 3D learning experiences to students. Tasks are later used to develop learning plans.

Meaningful Learning Outcomes

Specific student learning outcomes should be documented. This step in the process serves as a metacognitive check on the development of learning performances, tasks, and the 3D learning of source DCI.

Process: Learning Blueprint

- We loaded the boards with a few (Phenomena) Questions & Learning Performances

- We are asking you to add:

  + 2-3 of your Questions

  + 2-3 of your Learning Performances

  + Tasks

  + MLOs

Lesson Construction

Lesson plans with specific detail for
practical application of learning blueprint structure

Tasks
in support of learning

Utilize **Learning Blueprint Tasks** to design the Learning Map and Learning Plans.
*Refer to the Blueprint for sequencing and 3D learning support.

Learning Map

Define a sequence for unit lessons. Multiple lessons of varying duration and scope are required to achieve the intended learning captured in the Blueprint.

Unit:

Name(s): First Last
Target Grade Level:
Domain(s):

Lesson Architecture: Learning Map

WEEK___
WEEK___
WEEK___

NAME:
GRADE:
DOMAIN:
NOTES:

LEARNING PLAN:
LESSON NAME:
DURATION:

STANDARDS
Performance Expectation *(targeted by the end of the unit)*:
- DCI(s) targeted for this lesson:
- SEP(s) for this lesson:
- CC(s) targeted for this lesson:

LEARNING PERFORMANCE(S)
-

INSTRUCTIONAL SEQUENCE
Materials needed:
Instructional strategies:
Time required:
Cautions:
Introducing the Lesson:
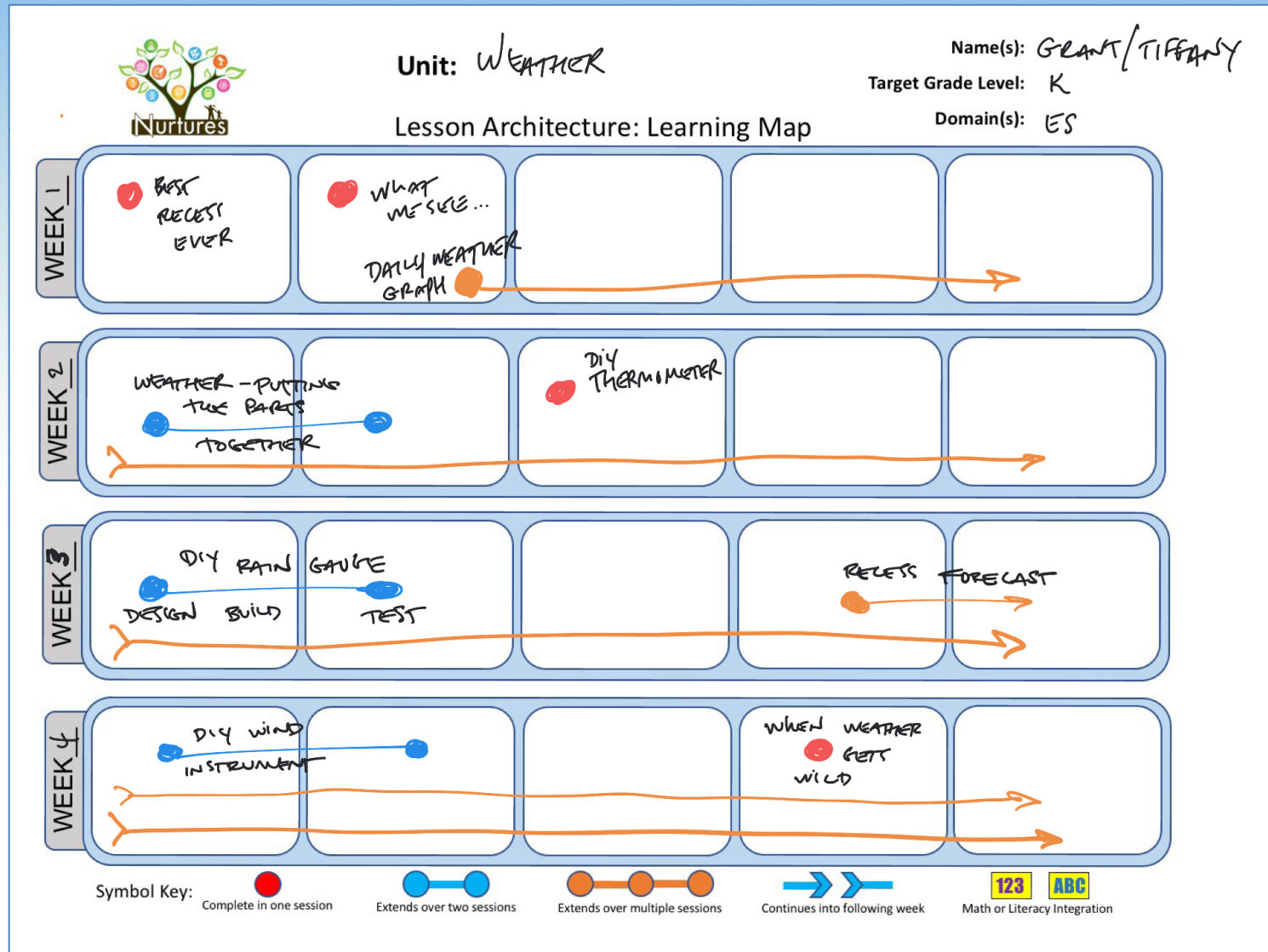Instructional Tactics:

DRIVING QUESTION
-

EVALUATION

Based on SLIDE lesson plan format used in Krajcik, J. and Czerniak,C.M. (2014). Teaching Science in Elementary and Middle School. New York: Routledge.

Learning Plans

Individual plan providing instructional context and details sufficient to deliver the lesson

Process: Lesson Construction

Learning Map

Process: Lesson Construction

- We are asking you to draft:

   + L|A Learning Map

   + Mock-up some epic learning plans

Sharing

- We are asking 2-3 volunteer groups to share:

  + L|A Learning Map highlights

  + Lesson ideas

Debrief & Discussion

- How was your experience with the L|A process and tools?

- When were you most consciously thinking about *all three* dimensions of the NGSS?

- In your own context, how might this process, or elements of this process be useful for you?

- What are other similar/related/connected processes?

- Additional thoughts, comments, or feedback?

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