5 Day professional Development Class

Mon	Tues	Wed	Thurs	Fri
Teachers as students	***Teachers as learners***	***Teachers as learners***	***Teachers as teachers***	***Teachers as teachers***
Intro to Engineering 6 Hat exercise Using artifacts to show engineering is everywhere The 3 Little Pigs using the design process	Continuation of The 3 Little Pigs Building Mockup Reflection MA Frameworks (Science/ Engineering) Connecting to literature Connecting Math & Science: Charlotte's Web	Owl Moon Shaping Requirements Morphological analysis Measuring Success, assessment strategy Developing thinking skills: • Bloom 21st Century Skills	What makes a good book? Elements of a lesson plan Choosing a book • Priming • Generative • Convergent Development of lesson plans Create sketch models Assessment/Feedback	Build models Review/ reflection Presentations What tools have we learned? Other activities using Design Thinking Planning Celebration/ reflection

General activities/Set-up

Team set-up and changes:
- Write on a 3x5 card the answers to the following questions that you will share with your team members:
  - What skills will you bring to the team?
  - What knowledge will you bring to the team?
- Create roles & values for your team

Use of colored note cards/ post-it notes on large white sheets
Think magical
Hand-outs: Learning to think table, story flow map, lesson plan, list of tools, strand 4 of science framework, science morphological chart, 6 hats, list of definitions, story map,
More focus for next course: 1) Instructors model the use of 6 hats strategy throughout course. 2) More focus on the importance of questioning – both the teacher's questions to the children and ways of encouraging the children to ask productive questions. 3) Consider for next course – organize handouts in a binder by day.

Day 1

Activity	Intend learning outcome
Introduction to the Class	Set the stage to why we are doing this. What are our objectives, What do you want to gain from this class?
Introduction to engineering .. *you know more about engineering then you think*	First connection to engineering, Definition of key careers and their relationships, draw picture. What do engineers do?
6 Hats	Ed DeBono method of creating a dialogue. To be used through out the 5 day session. Show the technique using a difficult question that would stir conflicts in people.
Using artifacts to show engineering is everywhere	Evaluation of design attributes from some familiar devices; Ice cream scoopers, garden hose spray nozzles, flashlights, Plate scrubbers. What problems were they trying to solve?, How was science and math involved? Create a matrix comparing the devices using their attributes
Model the 3 pig story with the teachers as	Model the priming phase of listening to the needs and values of the characters in the story

students	• Story mapping • Needs • Problem framing • Constraint of Science **Pick one or two design challenges to work on.** Generative process • Brain writing • Using the constraint of science, see how you can create a few designs or new ones Convergent Process • Development of the requirements • De a decision matrix to determine the best fit

Day2

Activity	Intend learning outcome
Introduction for the day	Set the agenda, reading
Continuation of the 3 pigs	• Gallery Sketches • Modeling/ building • Presentation by teams
Reflection	How would you use this in your classrooms?
MA framework	Discuss the 4 strands and details of what makes up the framework; guiding principles, experimentation, etc. The relationship among the different elements The engineering/technology elements **What's missing**
Connecting to literature	Show how the design challenge can come from literature stories
Charlotte's Web	Read chapter 3 , Escape • Values of the characters

	• Teach Morphological analysis
	  ○ Bird example
	  ○ New type of vehicle
	  ○ Grocery shopping
	• DaVinci's technique
	• Connecting to science using keeping Wilber warm at night
	• Make a gallery sketch

Day3

Activity	Intend learning outcome
Introduction	Agenda
Movie	Owl moon movie from the web, use instead of reading book.. ask them to bring in book
Priming activity	Story map, needs, value, science constraint
Generative	Shaping: Way to sort ideas based from " Wild thoughts" to the "Status quo".
Convergent	Requirements, Decision Matrix
Measuring success	Assessment … idea is to have assessment a part of the design process. Want the children to take ownership and determine what will make them successful
Tools of Engineering	Thinking Skills connection to the design process

Day4

Activity	Intend learning outcome
introduction	Review agenda. Give Story Flo Map as handout. Briefly review.

What makes a good book?	Discussion on what type of books are good for this process. Whole class discussion of what kinds of books make good choices for finding design challenges. Consider values, finding problems, building models, level of interest to students, etc. Record discussion on large chart. (Instructors create handout from chart.)
6 hats	Ed DeBono method of creating a dialogue. To be used through out the 5 day session. Show the technique using a difficult question that would stir conflicts in people. Each team uses 6 Hats strategy to choose a book for writing their own lesson plan. Discuss how they might use 6 Hats in their classrooms. Have teams share how they used the 6 Hats strategy and their ideas for adapting to their classrooms. Written reflection.
Lesson plan development .	Brainstorm elements of a lesson plan. Whole class review of possible elements of a lesson plan; record on large chart.
Work on their story 75 min	Teams work on lesson plans, including finding design challenges, possible solutions, curricular constraints, requirements, solutions, sketches. Refer to the Story Flo Map for elements of the design process.

Day5

Activity	Intend learning outcome
Introduction	Agenda
Finish story development Teams present their processes, sketches,	Defining • Gallery Sketches

models and self-evaluations. Written reflections. **90min**	• Building • Presentation
Implementation Considerations	Logistics/ Organizing your students and project to be successful Discuss in teams & then share with whole class
Setting up an environment	Thoughts
What have we learned **60 min**	Teams generate lists of what they've learned in the course and how they can apply the knowledge/strategies in their classrooms. Record on large charts. Share with class. (Instructors create handout from charts.)
Design thinking "bugs" in school Social studies/ current events problems (i.e. oil spill) Design a room Design learning space in classroom with kids	Other applications of design thinking Review rules for brainstorming. Teams brainstorm design activities they might do in their classrooms (other than using stories). Instructors provide some examples first. Teams choose one idea to develop and flesh out plan.
Plan for the beginning of the year	Teams choose a picture book and begin to design a lesson plan for an introduction to the literature design process for the beginning of the year
Celebrations	Final feedback sheet Celebration (Teams give reward to their members.)