**NEDC MESA MODEL OF INSTRUCTION**

**Identify Problem/Needs:**

*Engage*

Guiding Questions: *How can we help people through science and engineering?*

*How do we make people the focus of our projects?*

*What is Human Centered Design?*

*How do I approach the National Engineering Design Challenge?*

-Have students prepare engineering notebooks (to comply with MESA guidelines)

-Have students get in groups of 3-4 and do the “MESA Challenge-Operation Drop-in-aid”

-After the challenge, engage in a discussion about the effectiveness of each device.

Instead of focusing though on why or why it didn’t work, steer the discussion towards

the purpose of this project, which was to help people. Define Human Centered Design

as an engineering/creative solution that is rooted in the actual and real needs of people

**Research/Explore:**

*Explore*

-Review NEDC rules, making sure to discuss each area and requirement. Insure

students understand the components of the competition. Focus on the Human Centered

Design purpose of the competition as the key component of the unit, but remind students

to keep a good notebook (for their paper) and to keep the presentations and pitch in

mind as they go through the unit.

-Watch videos to introduce idea of “Human Centered Design:”

<https://youtu.be/0bxtEqM2TQU>

<https://youtu.be/NBu1kkSCHfs>

-Have students remain in their groups. Groups must be no bigger than 4 per group (per NEDC rules). Have each student in the group write down on post its as many relevant and important issues that affect people as they can. Have the group them “issues” in the following categories (on a wall or desk):

HOME: Issues that affect me in a personal way (Im directly impacted)

COMMUNITY: Issues that affect people I know or may come in contact with in my

Neighborhood. I may or may not be personally affected

WORLD: Issues that affect strangers and large numbers of people, but may not

directly impact me in a personal way

If there are issues that overlap, or really big issues (e.g. global warming, recycling, disease) have students come-up with “sub-issues” to break down the topic further. (example: “Epidemics” can break down to “communicable diseases,” to “West Nile Virus” to “the increase of West Nile Virus in my county.”)

-Have groups select one HOME/COMMUNITY issue to begin to unpack. Among the criteria for selecting the issue is selecting an issue that is impacting them personally or people they know.

-Have students review pages 31-33 in the HUMAN CENTERED DESIGN GUIDE. Complete FRAMING YOUR DESIGN CHALLENGE sheet on page 165 of the guide.

-Have students conduct research on their chosen issue, using SECONDARY RESEARCH sheet from pg. 37 of HCD GUIDE.

-Prepare for interviews, if necessary, by completing page 44. of HCD GUIDE: DEFINE YOUR AUDIENCE.

-If necessary, pick people identified as an audience, and plan for interviews. Use INTERVIEW GUIDE worksheet on pg. 166 of HCD GUIDE to develop questions.

-Conduct interviews, if necessary, using page 39-40 in HCD GUIDE for guidance. Interviews of classmates/school officials may be conducted during the school day, while interviews of others may need to be done over a weekend or after school. Regardless, allow time for this pivotal part of the process (2-3 days as necessary).

**Develop Possible Solutions**

*Extend/Elaborate*

-Its time for groups to gather their ideas and findings from research and interviews to

choose to determine what they will be building/making. Do DOWNLOAD YOUR

FINDINGS sheet on pg. 77 of HCD GUIDE. (Note: Download in this context means for

each team member to share their findings and ideas)

-From the many ideas generated, determine themes for the ideas. Do pg. 80 FIND

THEMES of HCD GUIDE.

-Groups now work to create problem statements from the themes generated. Do

CREATE INSIGHT STATEMENTS on pg. 176 of HCD Guide. Use pg. 81-83 of HCD

GUIDE as guidance.

**Choose Best Solution**

*Explain* (at minimum, in their log book)

-Teams choose the most relevant and doable INSIGHT STATEMENT, and use it as an

idea base for their project. Do pg. 111 DETERMINE WHAT TO PROTOTYPE of HCD

GUIDE. Teams will now have a direction for their prototype.

-A storyboard of their prototype idea will not only help students visualize their solution,

but will help them in the planning of their presentation and discussion of their project. Do

pg. 113 STORYBOARD of HCD GUIDE, using pg. 114-117 as reference and storyboard

worksheets on pg. 178 for the storyboard.

**Create Prototype:**

-Build project/prototype based on ideas (remember itemized budget sheet is part of

project)

**Test and Evaluate:**

*Test*

Compare prototype to specifications

Test prototype. As this is an HCD project, field testing will probably be needed

*Evaluate*

Once a working prototype is created, work on the Pitch, Interview and Symposium parts of the competition.

Use your engineering notebook to inform the Project Report that you will also need to produce for the competition.

**Redesign (Make it Better):**

*Explain/Extend/Elaborate* based on findings of Test and Evaluate of Prototype.

*Most of this curriculum is taken from the document “The Field Guide to Human-Centered Design” By IDEO.org, 1st Edition © 2015. Per their conditions, we are not endorsed or do not endorse IDEO.org products or services. Materials used also were not altered, and were presented just as they are in the field guide.*

*As the document is not directed at a specific grade level or audience (it is a publicly sourced document), advisors with younger students may find the content is a little above their heads. Please review the HUMAN CENTERED DESIGN DOCUMENT thoroughly yourself before applying this curriculum.*