**The Frugal Teacher STEAM Design Challenge (100pts)**

After completing reviewing the VibroBOT challenge, candidates will work in teams to develop an invention design challenge for children without the use of fancy commercial STEM kits; instead using simple, readily available, and reusable materials. The deliverables for this assignment include an exemplary teaching model (individually developed) and a written activity (collaboratively developed) that includes the following sections:

Title: Use a catchy title the will attract the attention of students and provide a hint at the task in front of the students.

Grade Range: Use content knowledge concepts from big ideas to determine the appropriate grade level of the design brief.

Standards for Technological Literacy: Identify STLs and benchmarks that are appropriate for the design challenge. Bonus: identify addition standards from science, mathematics, art, English language arts, social studies, or additional content areas would be appropriate for the design challenge.

Big Ideas: Identify the major concepts (connected back to grade level standards) that will be delivered through the design brief.

Essential Question: What open-ended question or questions will the student be able to answer after completing the design challenge?

Scenario: Write an engaging scenario that will capture the attention and possibly intrigue the students. Fictional scenarios are entirely appropriate. A good scenario will place the students into the story or challenge. Starting with a book is always a great place to start.

Challenge: In specific terms, identify exactly what the student teams are required to do to fully answer the challenge in the design brief – start with –

* Design, make, or create a ……….

Tools, Materials, and Resources:

Tools: Wire cutters/strippers, CO2 laser, 3D printer, specifically identify all additional tools

Materials: 3v small project motor, 22 AWG wire, AA batteries, Battery holder/Switch, 10 Ohm 1/4W Precision Resistors, LEDs, paper, pencils, markers, recycled materials, set of 4 – wheels and 2 – axels, recycled materials (be specific), specifically identify all additional materials

Resources: Specifically identify additional resources

Results/Deliverables: Identify what (exactly) the students need to deliver to the teacher upon completion of the design challenge (i.e., what product, notes, journal, etc.).

Limitations/Parameters/Constraints: Identify the boundaries for the students (maximum size, materials allowed, how fast/slow, etc.). Think about all of the ways that student creativity might take their solution beyond your boundaries.

* The prototype must have a purpose or mission identified in this section.

Evaluation: List, in specific terms, how the students will be evaluated – rubrics, checklists, etc. and provide the products.