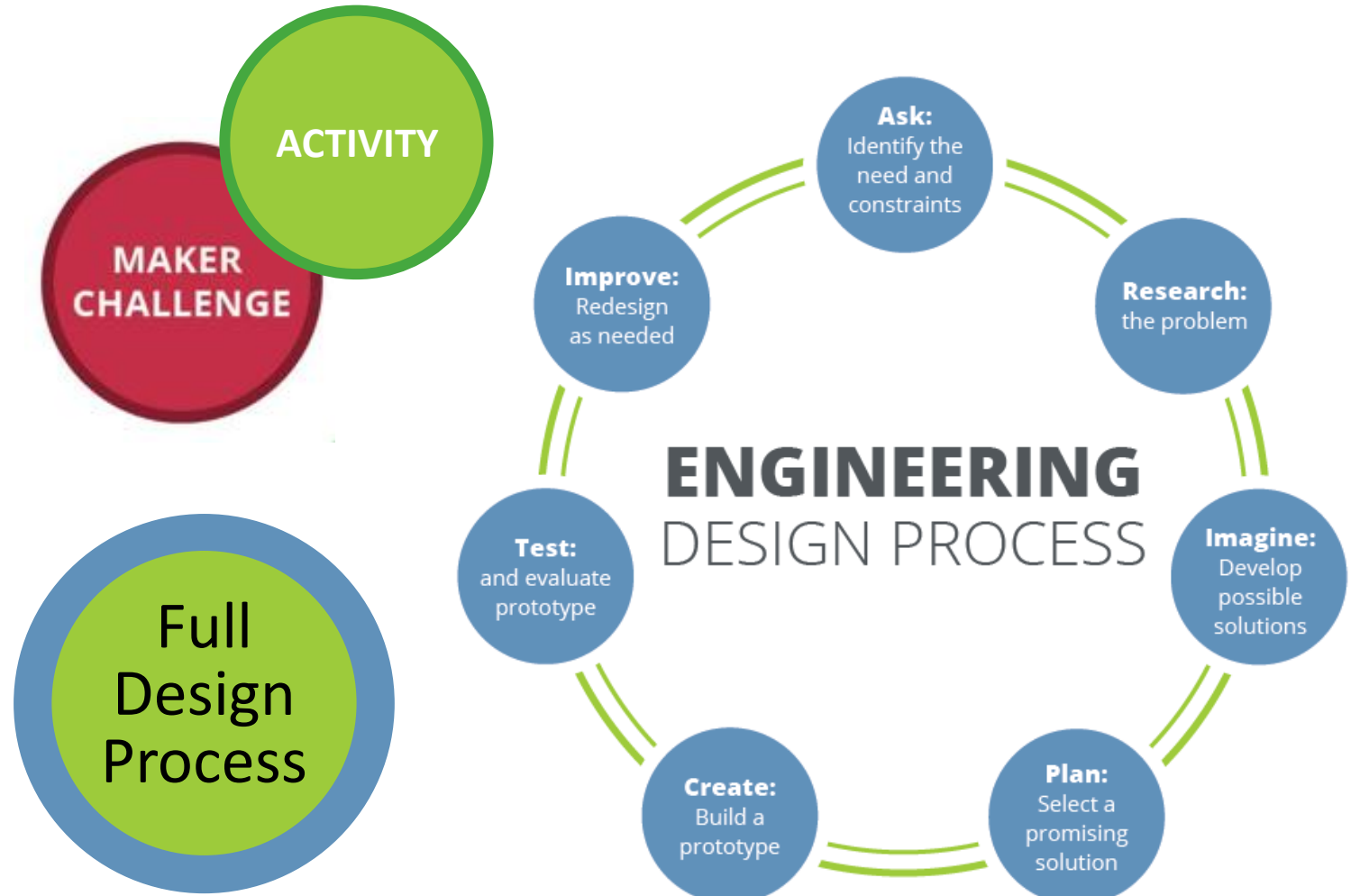


Research Experience for Teachers
Enhancing Knowledge and Skills in Advanced Manufacturing

Texas A&M University
Summer 2019

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Where is my Flag Holder?



For implementation in 11th grade Computer Integrated Manufacturing

Scenario:

The students and I return to a freshly painted classroom this fall and noticed that the wall bracket that supported the Texas and US flags is missing. The flags are rolled up on my desk. For the first week of school I unroll and hold the flags up during the National and State pledges. This became time consuming. I then place the flags in a vase on my desk. This obstructed my view and is easily tipped over. Having not been successful in locating the wall bracket and not getting a reply from custodial or maintenance staff I present the class with this design challenge.

The challenge:

Design and 3D print a working flag holder for our classroom.

Criteria:

A single device to hold two flags.

3D printed in ABS Plastic.

Must attach to the wall with 2 screws.

Flags should hang at 45-60 degrees from vertical.

Flags must not touch.

The US flag must hang equal to or slightly higher than Texas Flag.

Flags must be easy to remove from the device.

Use as little material as possible.

Procedures:

After reviewing the design process and Autodesk Fusion 360 the students will be divided into groups of 2.

Students will be provided access to the flags, the 2 screws and measuring tools, including; calipers, protractors and yard sticks.

Evidence of following the design process will be recorded in individual student engineering notebooks.

3D models will be created with Autodesk Fusion 360 and technical drawings with dimensions printed.

After checking the drawings students may print a 3D model/prototype of their design, modify and reprint if necessary.

Evaluation:

The device meets specifications/Design criteria.

Most efficient device/least material used.

Student critic and presentation.

Students select and mount the best design to the wall and display the flags.