# Lesson Plan

# Design and Draw for Production

## Unit 10 | Section 1 | Puzzle Cube Design | Day 1-3

### ITEEA Standards

5-8. Attributes of design 5-9. Engineering designs 5-10. The role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving

### Objectives [SWBATU]

* Design problems are seldom presented in a clearly defined form.
* Requirements of a design, such as criteria, constraints, and efficiency, sometimes compete with each other.
* The design process includes defining a problem, brainstorming, researching and generating ideas, identifying criteria and specifying constraints, exploring possibilities, selecting an approach, developing a design proposal, making a model or prototype, testing and evaluating the design using specifications, refining the design, creating or making it, and communicating processes and results.

#### Success Criteria

* Visual proof showing use of the design processes
* Refinement of designs (continuous improvement)
* Prototype development

### Materials

* Laptops/computer lab access
* Drafting tools and materials
* 3D printer + filament

### Resources

* U10S1 Handout 1 [MD]
* U10S1 Introduction [PPT]

### Instructional Outline

* Review design and engineering process
* Discuss the overall project and what we will be doing along with graded assignments
* Creating a 3D puzzle cube made of plastic via our 3D printer
* Each piece will need to be interlocking
* Technical drawings to start indicating ideas and understanding
* Approval of technical drawings in order to move into CAD of pieces
* 3D model and Layout of each piece and combined puzzle piece
* Go over the design brief and problem statement
* Provide methods of designing the prototype
* Students can begin their design brief and design their prototypes

#### Closure

Students should communicate their ideas and solutions to classmates, teachers, and family and community members using sketches, models, and verbal descriptions. Through this communication process, they will be able to reflect on their progress, as well as to receive ideas from others while completing the assignments

### Assignment / Activities

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| --- | --- |
| Assignment | Grade |
| Defining our problem statement and creating a design brief | 100 points |
| Designing 20 solutions, the road to 20 | 100 points |

### Added Notes