Science and Engineering in Plastics Manufacturing

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Lamar University College of Engineering
Research Experience for Teachers Summer Program
Sponsored by the National Science Foundation
Mini-Grant

• Pasadena ISD Education Foundation
  • $1,000 - $5,000 grants for district teachers
  • Easy application process
  • Featured grant application auctioned at Taste of the Town
Mini-Grant

• Education in Plastics Manufacturing

• $30,000 raised
Lamar Research Experience for Teachers in Advanced Manufacturing.

- Small group training with Lamar Engineering Professors
- Field trips! Field Trips! Field Trips!
- Hands on research
- Curriculum Development
Lamar Research Experience for Teachers in Advanced Manufacturing.
Education in Plastics Manufacturing

- Community Involvement
- PISD Mini-Grant
- Lamar RET
- Teach Engineering Lessons
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Goals:

Teach students about plastics and plastics manufacturing.

Use equipment and techniques relevant to real world manufacturing.

Create lessons that are aligned to TEKS
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Why it’s important:

Cumulative plastic waste generation and disposal

- Primary waste generated
- All waste discarded
- All waste incinerated
- All waste recycled

6.3 Billion Metric Tons

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Why it’s important:

STUFF WE NEED AND WANT
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Why it’s important:

STUFF WE DON’T WANT
Injection Molding Machine:

Advantages:
- Fast
- Easy
- Very Important Manufacturing Technique

Disadvantages:
- You need molds

$1,800 LNS Tech Model 150 A
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CNC Milling Machine:

Advantages:

• You can make your own molds

Disadvantages:

• Big Learning curve
• Will take a lot of time if you want students to use it

About $2300  Taig Tools CNC Mill
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- CAD/CAM Software
- Free
- Powerful
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Workflow for Making Molds

Paper: Come up with idea

Fusion 360
CAD: Create Model

Fusion 360
CAM: Create Toolpaths

Fusion 360
Postprocessor: Create G-Code

Text Editor: Modify G-Code

CNC Controller Software: Make Actual Part

Lamar RET
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Creating the mold in Fusion 360
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Creating the mold in Fusion 360

Make Mold by Boolean Subtraction
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Creating Toolpaths in Fusion 360
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Postprocess in Fusion 360

Edit by hand to Remove unneeded Commands
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Mill Parts using Mach3 Software and CNC Mill

Video: 20171003_155240.mp4
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Donations:
• Plastic Pellets
• O-Rings for Balloon Cars
• Silicone for Cut-out molds

Field Trip

Trunk-or-Treat
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Teach Engineering
STEM curriculum for k-12

Free online repository for Science and Engineering Lessons
Education in Plastics Manufacturing
https://youtu.be/FUsMfQol-4s