

# Materials & Manufacturing Summer Teacher's Institute: 2.0

## The Hammer Project

### Manufacturing with Plastics (Plastic Hammer Head)

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#### 1 Introduction – The Plastic Hammer

What is a Plastic?  
What is a Hammer?

#### 2 The Physics of Hammering – A hammer is an energy transformation device

Work and Energy transformation during stroke  
Conservation of energy during strike  
A Hammer is a Force Multiplier

#### 3 Overview of Plastics

Synthesizing of polymers  
Demonstration of Nylon Synthesis  
Chemical structure

#### 4 Plastics versus Metals (and Ceramics) – Properties versus Performance

Density  
Hardness  
Strength  
etc

#### 5 Manufacturing of a Plastic Hammer

Injection Molding  
Machining

#### 6 Applications of the Plastic Hammer