



**NORTH CAROLINA  
AGRICULTURAL AND TECHNICAL  
STATE UNIVERSITY**

## **2026 ASCE Carolinas Student Symposium Thor's Hammer Competition April 2 - 4, 2026**

### **Overview:**

In line with our theme of *Engineering Marvels*, the 2026 spotlight competition is Thor's Concrete Hammer Challenge. Each participating school will design and construct a concrete replica of Thor's Mjolnir, engineered for both durability and striking performance.

The competition consists of two main parts:

1. Design and Construction of a concrete hammer.
2. Performance Challenges completed by the hammer during competition day.

### **Design Requirements:**

- Each school may enter only one hammer.
- Total Hammer Length: 16–20 inches.
  - Handle Length: 9–11 inches.
  - Hammer Head Dimensions: Approx. 8.5" (length) × 5.5" (height) × 5.0" (width).
- Hammer should weigh between 8 and 15 pounds (to ensure safety and fairness).
- Reinforcement fibers and wire mesh are allowed and encouraged for safety.
- Each hammer must include at least one central reinforcing bar ( $\frac{1}{2}$ " max diameter) running through the handle and into the head with a minimum  $\frac{1}{2}$ " concrete cover on all sides.
- Molds will NOT be provided to schools. Teams are responsible for creating or sourcing their own.
- No paint, coatings, or external wraps are permitted.
- Colored concrete and etched or cast logos/designs are allowed.
- Teams may use marker or stamped text to display school name and team number.

## **Performance Challenges:**

### **1. Striking Light Weight Blocks Challenge**

- Contestants will use their concrete hammer to strike lightweight wooden blocks, each measuring 2 inches thick (blocks will be cut from standard softwood lumber for consistency).
- The goal is to break up to 3–5 blocks in as few strikes as possible.
- Blocks will be placed on a sturdy base. Only one block will be placed and struck per attempt, contestants may not stack or attempt to strike multiple blocks in a single swing.
- Scoring:
  - 5 points for each block successfully broken.
  - Bonus 5 points if all blocks are broken within the first three strikes.
  - The highest cumulative score wins this event.

### **2. Striking Target Challenge**

- A vertical target marked with five horizontal scoring zones will be used.
- Three villain targets (cutouts representing Thor's foes) will be attached at distances of 5 ft, 10 ft, and 15 ft.
- Each participant will have three strikes per distance (total of nine).
- Scoring:
  - 5 points per successful hit.
  - 1 bonus point per foot of distance for successful strikes
  - The highest cumulative score wins this event.

### **3. Durability Evaluation**

- After completing all strikes, each hammer will be inspected for damage.
- Points will be awarded based on structural integrity and visible cracking:
  - No damage: +10 pts
  - Minor surface cracks: +5 pts
  - Structural failure or breakage: 0 pts

## **Safety Requirements:**

- All participants must wear gloves, closed-toe shoes, and safety glasses during testing.
- A competition marshal will inspect hammers before striking events to confirm safety compliance.

- Any hammer deemed unsafe (loose handle, sharp edges, exposed rebar) will be disqualified from testing but may still be judged on design.

**Submission Requirements:**

- Each team must submit a Design Report (max. 2 pages) including:
  - Mix design and reinforcement details.
  - Estimated weight and dimensions.
  - Design sketches or 3D model images.
  - Brief description of the engineering inspiration behind their Mjolnir.

*The design report should be turned in the morning of the scheduled competition date.*

**Scoring Summary:**

<b>Category</b>	<b>Points</b>
Design & Aesthetics	10
Weight Efficiency (Lightest Hammer)	10
Striking Light Weight Blocks Challenge	25
Striking Target Challenge	25
Durability Evaluation	20
Design Report	10
<b>Total Possible Score</b>	<b>100</b>