Week 7: MPM (Simulation III).

**Motivation:**  
The other other simulations – cloth, sand, and snow

**Learning Objective:**  
Methodology of: sticky points, cloth sims, springs, Material Point Method   
Concepts of: collisions, self-collisions, viscosity, stickiness, constraints

**Schedule:**

Part 1:

* From the PowerPoint, run through the MPM Sand lesson
  + What is MPM? Why use MPM?
  + How is “sand” different from “particles”
  + Lead them through the “spinning stars” exercise from the PowerPoint, this shows emission, collision, and rendering.
  + Have them work through the “rake the garden” example from the PowerPoint, wander around and help
  + Short lecture on the gotchas and troubleshooting of MPM

**Break: 10m**

Part 2:

* From the PowerPoint, lead them through the MPM Snow exercise
  + Explain the extra controls – cohesion and hardening
  + Introduce and demonstrate the MPM Snow Scope
  + In class, ask them to change the resulting snow files to achieve a more wet look and behaviour with their snow
  + Work your way around the classroom, helping and taking note of their issues

**Break: 10m**

Part 3:

* MPM Cloth
  + Explain some systems used in cloth simulation: springs, soft bodies, nCloth and MPM
  + Using the PowerPoint, setup the cloth exercise from scratch in class
  + Together, explain and execute a constraint system
  + Work through the MPM cloth properties in class – area preservation, reference points etc
  + Take the class through tearing, making an example, using what we know about fields and what we have in the PowerPoint
* Optional homework – cache and export the MPM cloth to the Unreal Engine using USD mesh output. Ask for feedback on what worked and what didn’t – animated cloth would be a huge bonus here.