

### HW 3: A pink beach scene

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Beach: a sandy dune, the shape of some variety of quadric. Diffuse BRDF with projected planar texturing is sufficient (i.e. just use x, z coordinates of the shaded point, possibly scaled, as texture coordinates). [Also works as a handy shadow receiver.]

***The beach is an ellipsoid. The texturing was gained from a sin function***

Beach ball: a sphere with procedural texturing (e.g. the usual stripes) and Phong-Blinn BRDF.

***There is a purple and white beach ball with some shininess***

Parasol: a clipped sphere on a clipped cylindrical pole, shaded with the diffuse BRDF model.

***There is a parasol to the right of the tree. The sphere of the parasol top was scaled/stretched.***

Sand castle: an architectural wonder made out of clipped quadrics. Use clipped cones for bastions.

***The base of the sand castle is a box. The towers are cylinders. The tops are cones.***

Ocean (requires Beach): an infinite plane of ideally reflective water should surround the dune, making it an island.

***The ocean reflects the sky and the beach(+objects on the beach).***

Waves (requires Ocean): Use procedural solid normal mapping to make ripples on the surface, disturbing the reflections slightly.

***There are ocean ripples if you look closely.***

Shadows (requires Beach): a directional light source (the Sun) and properly cast (not plane-projected) shadows should be present.

***The objects on the beach create shadows.***

Palm tree: clipped cones make the trunk, clipped spheres are the leaves. The leaves should be shiny, with the Phong-Blinn BRDF model for specular highlights.

***There is a palm tree in the middle of the beach with shiny leaves***

Pinking (requires Palm tree): procedural solid texturing is used to discard ray hits on the palm leaves, punching holes in it, or making the edges pinked.

***The edges of the leaves have pinking. The reflection in the water is off though as a result.***

Flotsam: a cargo box washed upon the shore, or floating on the water. One way to implement this is to clip an infinite slab quadric with TWO orthogonal infinite slab quadrics. Add texturing (either procedural or image-based) on the box.

***There is a box floating in the water with strips as texturing***

Animation: if your implementation is real-time, animate at least two different objects (a bouncing beach ball, a floating cargo box, swirling ripples on the water, etc...). If your implementation is not real-time, render a short sequence of images and compose them into a GIF file manually --- a single animated object is enough.

***The box is floating in the water. The parasol top flies off its pole and falls into the ocean***