KF6018 - Report

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Lighting, Shadowing and Shading - press N for night mode to see full effect of lighting

- Lighting - press H to turn on spotlight helper
  - Spotlight on each target and Spotlight facing balloons
  - Shimmer on balloons (specular)
  - Torches (point lights) in each corner to dimly light the space
  - Ambient light to light day mode, turns off in night mode
- Shadowing
  - Shadows of the arrows cast to floor
  - Balloons cast shadows to the wall and onto themselves

Use of Material

- Textures
  - Grass
  - Fences/door
  - Pathway
- Normal mapping
  - Bumpy fencing
  - Rugged cobbled floor
  - Metallic door
  - Textured grass
- OBJ importing
  - Bow imported with OBJ, base texture and normal map with added shininess
- Materials
  - MeshLambertMaterial on target boards with high roughness
  - MeshPhongMaterial on balloons for high shininess with bright specular

The use of scene graph for organising 3D objects - parents and children listed below

- Scene floor
  - Balloon floor
    - BalloonTop (sphere)
      - BalloonBottom (cylinder)
    - Balloon Rest
      - Balloon darts
  - Target floor
    - Target boards
      - Target circles
        - Arrows
          - ArrowHead (cone)
          - ArrowMid (cylinder)
          - ArrowEnd (deformed boxes)
    - Bow rest
      - Bow

The use of transformation in modelling and/or geometry deformation

- The balloons are formed of spheres and cylinders which have been deformed so they form a balloon-like shape. I cut the sphere in half then morphed a cylinder so that it tapers at the bottom. The cylinder is a child of the sphere, making the balloon one solid object that only needs one set of coordinates and can be transformed on one scale.
- The arrows use geometry deformation to create the clearly identifiable shape of them
  - The front is a cone with 3 radial segments to get a sharp effect
  - The middle a cylinder with identical small top and bottom radius'
  - The end is 4 boxes that have had the vertices deformed in such a way that it has the appearance of a rhombus. This can be seen in the function deformBox()
  - Arrow positions are randomised each load, within target board bounds

3D geometry optimization for interactive performance

- The door has also been optimised for a player to open it. Being a static scene, the door currently uses a key press of SPACE to open it for now.

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References

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Fence texture
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