COMP220: Graphics & Simulation

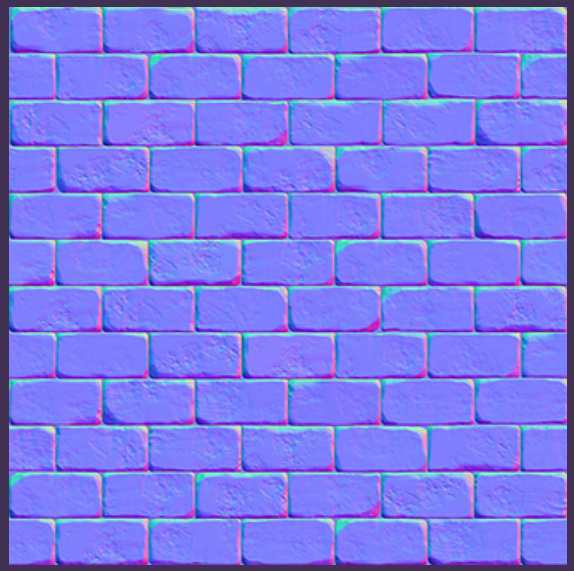
8: Materials and Lighting

Learning outcomes

- **Describe** how effects such as normal mapping can be used to render realistic materials
- **Research** Physically Based Rendering (PBR)
- **Understand** how PBR gives us realistic materials

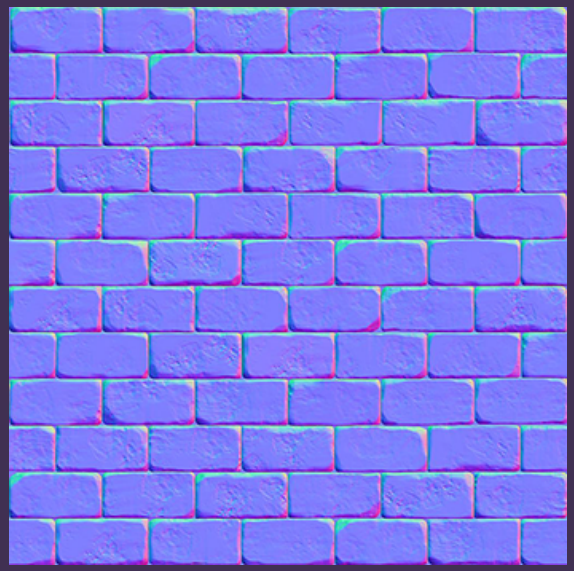
Normal mapping

Normal mapping



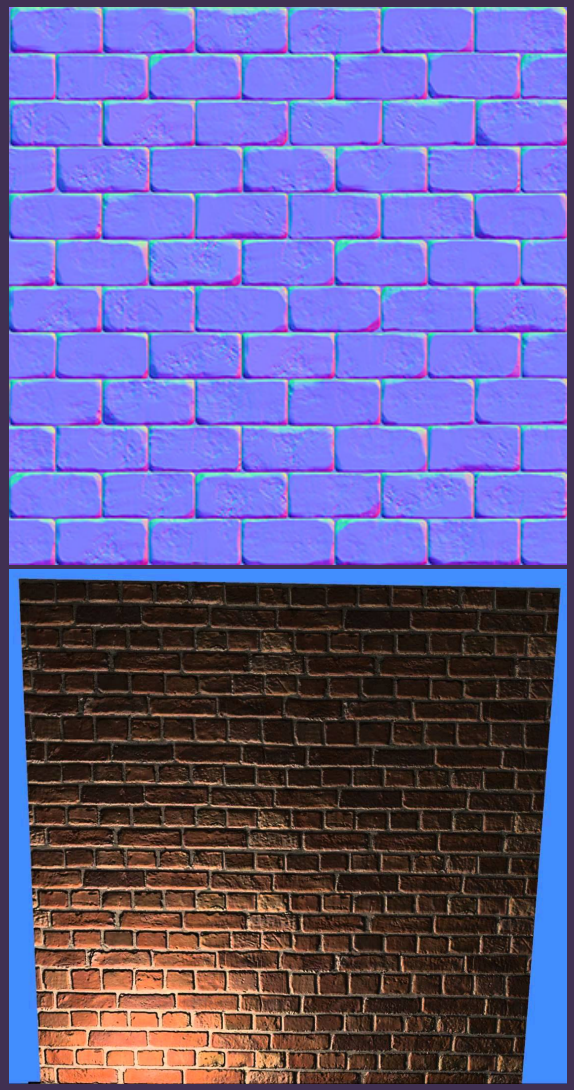
- A **normal map** is a texture which is used to slightly alter the normal across a surface

Normal mapping



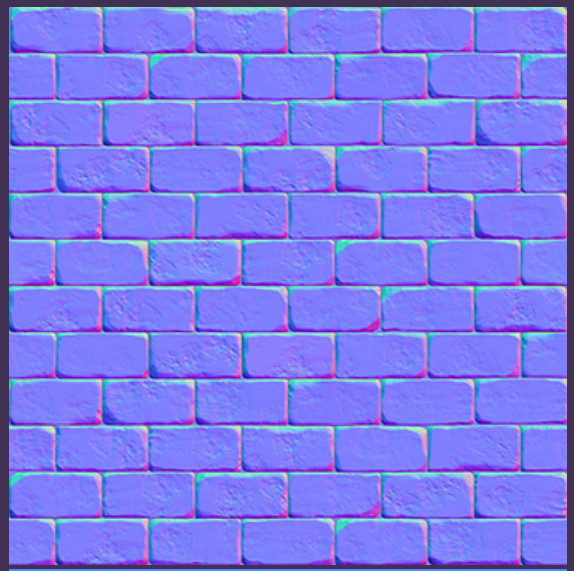
- A **normal map** is a texture which is used to slightly alter the normal across a surface
  - Each pixel in the normal map represents a 3D vector, with *xyz* mapped to RGB

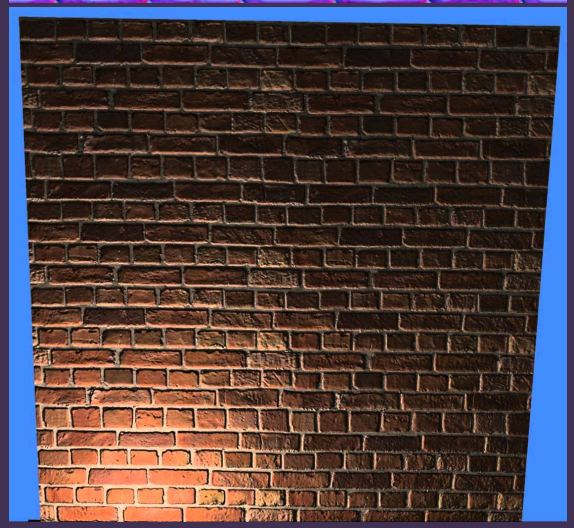
Normal mapping



- A **normal map** is a texture which is used to slightly alter the normal across a surface
  - Each pixel in the normal map represents a 3D vector, with *xyz* mapped to RGB
- Can be used to add detail to flat, low-poly surfaces

Normal mapping





- A **normal map** is a texture which is used to slightly alter the normal across a surface
  - Each pixel in the normal map represents a 3D vector, with *xyz* mapped to RGB
- Can be used to add detail to flat, low-poly surfaces
- Can use textures to change other lighting parameters across a surface, e.g. **specular mapping**

PBR Exercise

- Read the following:
- `https://learnopengl.com/PBR/Theory`
- Class discussion