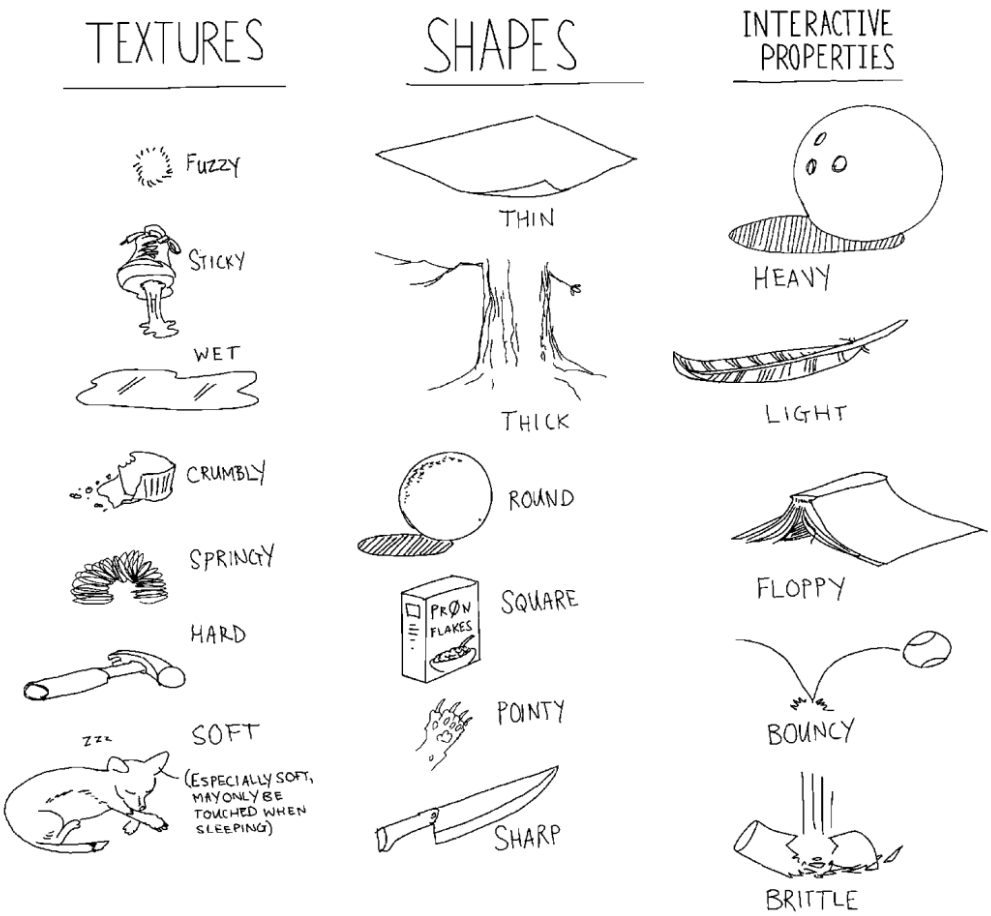
Lecture10 Polish Metrics

- **Polish**: any effect that creates **artificial cues** about the **physical properties** of objects through **interaction**
  - artificial: not simulated, it is "nonessential" and "layered on"
    - if these effects were removed, the essential functionality of the game would be unaltered
  - it provides the visual, aural and tactile clues a player needs in order to create a detailed, expansive mental model of the physics of virtual objects
  - it gives the **impression of a physical reality different** from our own exists
    - players can extrapolate a universe of possible interactions based on their observations and, in so doing, can experience a great joy of discovery and learning which is rarely possible in everyday life
- At the higher level, we're interested in the **interactions** that are supported by these various **effects**
- Many different effects, even across senses, can **support and enhance the perception of the same interaction**

1. The Feel of Everyday Things



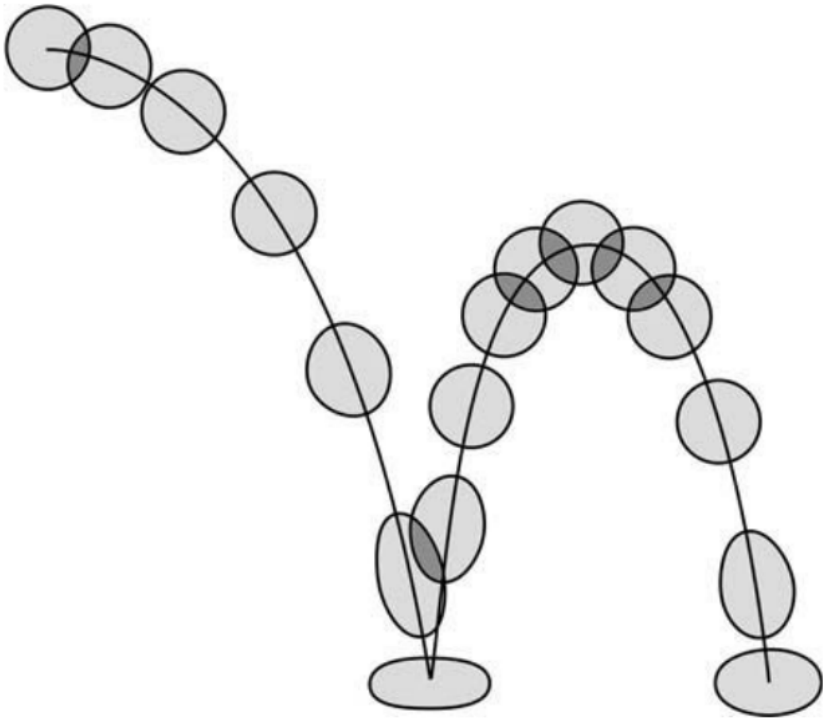
- **Real-world**: objective, absolute and specific, an absolute measurement —the same for all objects everywhere
- **Game**: the physical properties of an object in a game are entirely based on a player's subjective perception.
- What we're interested in tweaking, and tracking, is the general, relative, **subjective sense** that players have of the various objects they control and interact with in a game
- With that, we can examine the corresponding physical properties that the players are inferring in their minds from the nebulous, general sensation and trace that down to the level of individual effects
- This means that what we're actually interested in tracking are **not the physical properties of objects** in a game but **the players' perception and the clues that cause players to perceive the properties** of objects in a certain way
- Take the property of **mass**, for example. When we describe objects in a game with respect to their mass, what we really mean is **perceived mass**, which is derived from **a bunch of small clues, each of which must be designed, often as a polish effect**

Examine Polish Effect (3 different angles)

- As individual, free-standing effects whose motion, size, shape and nature can be measured separately from the simulated objects in the game
    - enhance and support specific perceptions
- As groups of effects which convey nebulous, general perceptions to the player
    - imply certain things about the physical objects in the game
- As observable physical properties that are inferred from groups of perceptions (such as mass, material and texture)
    - assembled by players into a cohesive concept of game world physics
- Polish gives players the grounding they need to **cope with the new, unfamiliar topologies of game space**s and the unfamiliar physics which govern them

2. Types of Polish

Animation



- Animation change the viewer's perception of the physical nature of the objects
- Animation can modify perception directly by applying principles such as **squash and stretch**, overlapping action and so on, to the movement of objects in their animations
- As animation is applied to objects in a video game, an animated object typically replaces the visualization of a simulated object
- The animated visualization becomes the object in the mind of the player, and so any **physical properties** it displays as it animates are perceived by the player as part of the motion of the object, even though they have nothing to do with the simulation
- The principles of animation apply almost directly to the motion of objects in a game
- The **animation drives the impression of motion** until such a time as the **character is affected by another force**, at which point the **simulation takes over**

Visual Effects

- Visual effects typically wink in and out of existence to serve a short-term need for indication of interaction between two objects
    - sparks shooting out when a car is scraping along a barrier
    - a spray of splinters when a crate is destroyed
- A visual effect appears to be caused by an object and **emphasizes the interaction** of that object with other objects
- Visual effects include particles, trails, sparks and other temporary indicators of interaction and movement
    - Most visual effects in modern games are made up of **particles**

    - a particle effect is **a series of textured planes that always face the camera**

Sound Effects

- Often times, **a whole range of sounds is created to represent a particular interaction**, with one chosen at random at any given instance of the impact (or whatever event triggers the sound) in order to keep a sound effect from becoming stale
- Impact-mapped sound effects can affect not only the perception of the objects interacting, but the surrounding environment as well
- Sound effects are **not necessarily bound to realism**. You can convey an impression of physicality with a noise much different from the apparent reality of the object.

Cinematic Effects

- Cinematic effects are things like screen shake, changes in view angle, motion blur and Matrix-style slowdown
- These are effects which are applied to the camera rather than an in-game object. As if the camera itself is affected by the game interaction
- These effects are applied to the in-game camera rather than to particular objects, but in so doing, the effects can change the perception of the physical properties of objects in the game

Tactile Effects

- This is limited mostly to **controller shake or rumble**, which is caused by the actuation of weight-loaded motors inside the input device
    - A gun has recoil
    - A rumble motors
- **Force feedback**: the controller provides actual, physical resistance to displacement, forcing the user to work at pulling, pushing or rotating it