**Materials**

* Water jug with cut top and hole punctured at bottom
* **(Optional)** Hose leading from hole at bottom that can direct/control outflow
* Tub to collect water
* Water cups/nozzle/garden hose/some source of water, both bursty and flow

**Procedure/Video Flow**

* Introduce the analogy of water as data, and the flow of data as a data **‘stream’** (“It’s useful to think of data as…”)
* Normal flow of data/water with input(s) at top and outflow at bottom (say, a router to a database server with multiple clients) - low waterline and continuous flow
* Router jug acting as buffer, can **‘soak’** (puns are definitely intended here) up bursty flow (water cups) with the queue (waterline) and transmit it orderly (FIFO - First In First Out)
* What happens when the waterline rises… why does it rise?
  + Outflow slows down (lots of traffic at server)
  + Lots of inflow
* Dropping of packets as spilling of water (the first one in gets dropped - unfair, but alerts to dropping most quickly)
  + Where do the dropped packets go? -> They’re gone. The router doesn’t care, nor does it alert anyone (*the router may log how many packet it has to drop*)
    - Eventually the sender will realize the the receiver is not getting these packets, and it will slow down its traffic (acknowledgement)
  + The core internet is “best effort”, and the responsibility of packet loss is on the edge of the internet

**Things to point out/talk about**

* Water is a common analogy for **‘streams’** (hence the name), including data streams and electric **‘current’** (again, the name)... we will be using lots of water-related puns

**Script**

* Hello, I shall be describing store and forward routing… using water!
* Water is commonly used as an analogy to concepts such as data streams and electric current. Here I shall be using the former analogy, along with my amazing contraption.
* The water (in here, trust me it’s in here) is data, the flow of water a data stream, and this cut bottle a router.
* The top of the bottle signifies intake from clients and the bottom straw an output to, say, a database server.
* Everything in the middle, the capacity of the bottle, signifies the internal buffer of a router, which stores the water (data) before forwarding it to the output
* \*Demonstrate\*
  + Queue, normal flow
  + Increased flow, filling up
    - Pause to show queue
  + Output traffic congested
  + New client burst
  + Packet dropping