Given a 32-bit MIPS Datapath where the page size is set at 4096, the number of physical pages allowed in memory is 2^18, show how virtual mapping is performed. How big is the physical page number, and draw the representation of the Virtual-to-Physical address translation.

$\log_2 (4096) = 12$

$32 - 12 = 20$

$12 + 18 = 30 \Rightarrow$ Physical $= 30$

```
31                          12  11              0
   Virtual Page #              Page Offset
              ↓
       ( Translation )                |
              ↓                       |
 29                       12  11      ↓       0
   Physical Page #            Page Offset
```