

5-3 The BJT as an Amp and Switch

Q: *Since BJTs and MOSFETs are actually quite **similar**, are they used to build similar things?*

A: Yup! We can use BJTs to build **amplifiers/oscillators**, or to build **digital devices**.

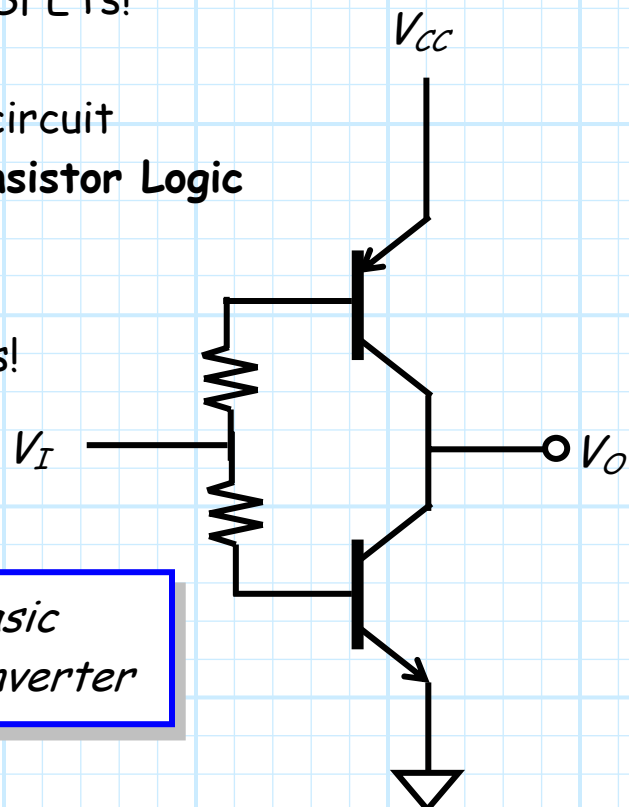
→ The BJT mode for amplification is **Active**.

→ The BJT modes for switching are **Saturation** and **Cutoff**.

Note again the **analogies** to MOSFETs!

For years, the standard digital circuit technology was **Transistor-Transistor Logic (TTL)**.

TTL and CMOS are close cousins!



*The Basic
TTL Inverter*



Back in my day (a long time ago!) TTL was much **faster** than CMOS, thus TTL was **prevalent**.

Now, CMOS (in addition to all of its other **ideal** characteristics) is faster than TTL, thus TTL is basically **obsolete**.

Q: *Does that mean that BJTs are likewise obsolete?*

A: NO! For example, BJTs are used in a digital technology called **Emitter-Coupled Logic (ECL)**. ECL is a **very fast** technology—but also requires very high **power**!

Mainly though, BJTs are used in **amplifier** design, as they often can provide **higher gain** and **wider bandwidth** than their MOSFET counter parts.