Cartoon Network is a neural-network simulator that is simple and fun to use. It is designed for playful exploration of neural signaling so that students of all ages can gain insight into the incredible power and complexity of neural networks. The interface (Figure A) is simple enough for grade-school students, but the principles are deep enough for even graduate-level exploration.

**Cartoon Network is free, open source, and cross platform. It runs on any machine with Java installed.**

* Download the latest version of Cartoon Network from this link:
  + <https://tinyurl.com/get-cartoon-network>
* Double-click on the downloaded .jar file to run Cartoon Network
* Use the menu on the left hand to access the different simulator functions. A table of short-cuts is shown in the FigureB below.

**Cartoon Network can be the brains for a simple USB robot known as the FINCH robot (Figure C).**

* You can order a FINCH robot from BirdBrain Robotics (<https://www.finchrobot.com>). They run $99 less a 10% educators discount. BirdBrain Robotics also has an equipment-loan program
* I also have a set of 7 FINCH robots I can loan out if you are willing to pay shipping. Email me at [rcalinjageman@dom.edu](mailto:rcalinjageman@dom.edu)).
* Once you have a FINCH, connect it by USB to your computer, run Cartoon Network, and then type “C” to connect the FINCH to cartoon network.

**How do I use this in my classes?**

* As a demonstration – you can bring up cartoon network (with or without a FINCH) to demonstrate basic aspects of neural signaling (excitation, inhibition, reflex circuits, intrinsic activity, feed-forward excitation, etc.)
* For exploration – with a set, students can work in teams to complete different challenges (make a circuit that is always active; make a circuit that gets the FINCH to follow light; etc.). Challenges can be scaffolded from simple to complex. I have found that students as young as 8 can work with the simulator and FINCH robots.
* You can download a sample lab handout here: [**https://github.com/rcalinjageman/cartoon\_network**](https://github.com/rcalinjageman/cartoon_network)
* There is also a paper describing the simulation in more detail along with assessment data in the Journal of Undergraduate Neuroscience:
  + Calin-Jageman, Robert J. 2017. “Cartoon Network : A Tool for Open-Ended Exploration of Neural Circuits.” *Journal of Undergraduate Neuroscience Education* 16 (1): 41–45. <http://www.funjournal.org/wp-content/uploads/2017/09/june-16-41.pdf>

