

STEAMing into Ringwood Public Library: Coronavirus Issue

Science

Technology

Engineering

Arts

Mathematics

What's happening this month at the library...

[Crazy 8's Math Club Online for Grades K-3](#). Open enrollment through May 22.

[Simple STEM video series on YouTube](#). Projects you can do at home without buying anything.

[STEAM activities on our website](#).

[See our full schedule here.](#)



There's an app for that...

Audubon Bird Guide by National Audubon Society. It's the perfect time of year to start birdwatching. This app will help you identify over 800 species of North American birds. It includes audio clips of bird songs and calls and shows range maps. Find it in app stores for Android and iOS. Email required. Free account optional.

May is Mental Health Month

Here are some resources to nurture your mental health:

- Hoopla's [Yoga video collection](#).
- Hoopla's ebooks about [mental health](#).
- [Ringwood Health Department's Webpage](#) or [Ringwood Health Department's Facebook](#) page.



COVID Pandemic and Immunity...

In last year's May issue, we wrote about the Measles outbreak. This year, we are dealing with a historically unknown virus. One important way to end the pandemic will be for scientists to come up with a vaccine for it. A **vaccine** is a way to fool a body into creating immunization to a virus it hasn't yet been exposed to. Our bodies make natural antibodies when they are exposed to viruses, bacteria, or other pathogens. These antibodies stick around to put up a fight against future infection to the same or similar pathogens. Viruses, unfortunately, can evolve pretty quickly. That's why we need new flu vaccines each year. Just because someone is "immune" either by exposure or vaccination, does not mean they cannot spread germs for a disease. Think about the germs on all the surfaces you touch and how many people may have touched a surface before you, how many other surfaces you'll touch, and how many people will touch those surfaces after you. That's why it's important to frequently wash your hands.

Vaccinations help keep populations as a whole healthy. If most of the people in a population are vaccinated, then those who cannot be vaccinated also have a lower risk of contracting the disease, because the disease isn't wide-spread. Fewer people contracting the disease means there are fewer germs to spread around. This is referred to as herd immunity by scientists. Learn more about the importance of vaccinations in our society at [Science News for Students](#).

Immune: being resistant to an infection; **Immunization:** the action of becoming immune

Antibody: a protein created by an organism in the presence of an antigen (an invading substance or pathogen); An antibody binds to an antigen to rid the organism of it.

What is a virus?

A virus is a piece of nucleic acid (DNA or RNA) wrapped in a protein coating. DNA is the genetic material found in all cells of living things. RNA molecules help DNA replicate (make copies of itself) and make proteins (the building blocks of all of the traits of an organism.) The interesting thing is that viruses are not made up of cells. Bacteria, on the other hand, are single-celled organisms. Scientists debate over whether or not viruses can be considered living things since they are not made up of cells. Since viruses are made up of the material that codes for genes and proteins, they do replicate to make copies of themselves, but they need the cells of hosts to provide the “machinery” to do the work. Because viruses reproduce quickly and in massive amounts at a time, their genetic code can change quickly, too. It only takes days to produce generations of a single virus and changes in their genetic makeup can occur much more rapidly than in most organisms, where hundreds or thousands of years are needed to produce evolutionary change.

The coronavirus that causes COVID-19 is made up of an RNA molecule.

Organism: living thing

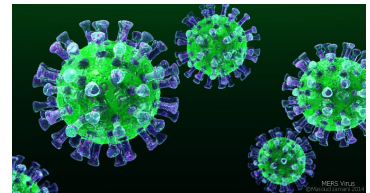
Host: an organism in which another organism lives



DNA = Deoxynucleic Acid
Chromosomes inside the cell's nucleus are made up of this genetic material. It's shape is referred to as a Double Helix (like a spiral staircase or twisted ladder.) The genetic code is held in the order of the nucleotide bases located on the "rungs."



RNA = Ribonucleic Acid
It's a single strand consisting of a sugar and phosphate backbone with spokes of nitrogen bases. There are different types of RNA that help DNA replicate and make proteins, which determine the traits of an organism.



Above: a MERS virus, a type of Coronavirus

According to [Sick Time](#) by Jon Cohen from the March 20 issue of the journal *Science*, we should exercise caution in entertaining the idea that COVID cases will wane in the summer simply due to the change in seasons. There is evidence that infectious diseases are seasonal, but there is no evidence that it is something inherent in the disease and not something in human biology, that allows for a disease to peak at a specific time of year. Also, different diseases show different seasonality: some have peaked in spring seasons; others in summer. Polio, for example, was a summer disease. COVID hasn't been around long enough to know what it's season will be, if any. Finally, it's in its first year of existence; it will most likely not show seasonality until there is wide-spread immunity (see COVID Pandemic and Immunity on page 1.)

As COVID progresses, scientists grapple with the idea of allowing volunteers to be subjects in testing experimental vaccines to help shorten the normal clinical trial and FDA approval time that can take the better part of a year. These experiments would involve inoculating, then infecting the trial subjects, without any precursory experiments looking for side-effects. **Do you think it's ethical?** For more, check out *Science's* April 3 issue articles [Vaccine designers take first shots at COVID-19](#) and [Infect Volunteers to speed coronavirus vaccine?](#) by Jon Cohen.

Click here or scan the QR code below to check out [Newsweek's article "We're All Looking For Answers"](#) about how frontline doctors are finding treatments on the fly and sharing their newfound knowledge during this Coronavirus outbreak. You will need an RB Digital account. Free with your library card.



Coming this summer:

Ringwood Library's Summertime Reading theme is *Imagine Your Story!*

Our STEAM Camp will be *Mythbusters*.

If you have tech questions or suggestions for RPL's STEAM Newsletter, email caldwell@ringwoodlibrary.org.