

January 2021

BREAKING THE IYSE

International Youth Stem and Education Society
Magazine



Special Topic

REMOTE JOBS IN STEM

Find some job opportunities
p7.

Featured

VACCINES

Learn more about Moderna
and Pfizer vaccines p15.

Word Search?



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Letter from the Magazine Director



Eunice Chon Magazine Director (Above)



Welcome to the International STEM and Education (IYSE) Society! Before you proceed through the first issue of our magazine: Breaking the IYSE, I would like to introduce our organization and theme of our January issue.

Founded by our president Blanche Chang and co-founders Jiawei Ryan Zhang, Jennifer Wang, and Charles Zhang, IYSE Society is a community and a worldwide platform where all youth can contribute new ideas to meaningful discussions constructively, bring fresh perspectives to the table, and get recognition and exposure for their excellence.

At IYSE Society, we value youth engagement and its potential to spearhead change when it comes to societal issues. Our organization aims to provide educational resources that connect youth, especially those that are underprivileged, to free educational resources and invaluable experiences. These include public events featuring professionals and leaders and an easily accessible digital magazine. Our magazine educates youth and keeps them up-to-date on complex issues, especially surrounding STEM in a digestible and approachable way. Additionally, we want to give unnoticed stories – issues that need to be heard but may not be published frequently by the media – a chance to shine.

2020 was a year unlike no other. The COVID-19 pandemic forced mankind to quickly adapt to an isolated, mainly virtual, lifestyle. Coronavirus has transformed how people eat, communicate, learn, and work. In response to the end of an

Letter from the Magazine Director (Continued)



An unprecedented year and the beginning of a new one, IYSE Society decided to attribute our January issue of Breaking the IYSE to COVID-19.

Writer Prudence Mutabari writes of the transition from traditional classrooms and workplaces to virtual learning and remote jobs. Because our magazine aims to support students with easily accessible educational resources, Matabari provides the advantages and disadvantages of online education as well as provides resources to make online learning more manageable. Matabari's piece on remote working provides a list of popular STEM jobs that can be done remotely and the surprising advantages and disadvantages that come with working from home.

Writer Joshua Altman describes what has changed due to the pandemic. The rise in the use of online meeting platforms has enabled people to attend professional and personal meetings without leaving their homes. Altman illustrates the boost in the online meeting platform industry and the uncertainty of the fates of such applications and websites. World reactions to COVID-19 have varied across different nations, and the new vaccines are a salient source of controversy. Altman writes of the split opinions regarding how we need to move forward.

Finally, our issue ends with editor Devashree Gupta's article on the Moderna and Pfizer vaccines. Gupta informs readers of the similarities and differences between the two vaccines and the optimism to be had for the near future. The facts are hopefully reassuring to readers currently hesitant to get vaccinated.

While IYSE Society understands the difficulties and frustrations that come with this pandemic, our organization remains optimistic about what will happen next. The January issue of our magazine reflects on the year 2020 and expresses hope for 2021. Friends, please stay safe, and enjoy reading Breaking the IYSE.

Best,

Eunice Chon

A handwritten signature in black ink, which appears to read 'Eunice Chon', is enclosed within a simple, hand-drawn oval border.

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ONLINE LEARNING

Prudence Mutabari

Image *below* shows working online with computer



The COVID-19 pandemic completely disrupted our 'normal' day-to-day running - with quarantining, wearing masks, social distancing, and more. We shut down our schools, forcing students and teachers to transition to online learning. Over 1.2 billion children lost their opportunity to learn, as their schools did not have the resources necessary to execute online schooling.

Online learning is a sector of the education industry that has been gaining traction over the last couple of years. According to Forbes Magazine, "Even before the pandemic, research and markets forecast the online education market as \$350 Billion by 2025." This trend is due to the fact that virtual learning is easily accessible, efficient, sustainable, and more cost-efficient than in-person learning.

Online learning allows students more flexibility to learn at their

own pace and choose what to learn at a cheaper cost. Students can learn various skills not taught in traditional classrooms. When done properly, virtual education improves students' time management and critical thinking skills.

Yet, there are difficulties that come with this transformative approach to education. For instance, students who have trouble with time management will struggle to keep up. It is easy to get distracted, and learners may feel socially isolated. The longer screen time will pose a risk to students' eyesights, and technological issues will most significantly hinder students from learning their material.

Through virtual school, students can access all sorts of information and courses from top educational institutions and sites through the click of a button. However, many have argued that the 'emergency remote teaching' has not enabled us to harvest the full benefits of online learning.

Thus, the next logical question is,

“How can one fully take advantage of online learning?”

Below are resources that will make online learning somewhat more manageable.

edX:

edX just might be the largest online learning platform. Students can access courses from various top universities all over the world right from the comfort of their home. The courses are self-paced and learners are granted access to the lecturers and group chats with people who are taking the same course as them. No money? No worries! One can just audit the courses and garner the knowledge.

Khan Academy:

Khan Academy provides high-quality instructional videos on a variety of subjects. From math, chemistry, physics, history, and writing. Students can learn at their own pace for free!

Coursera:

Coursera offers a wide variety of free educational programs. It focuses on higher education and professional training.

TKS:

TKS is a great program designed to replicate the learning environment and culture of Silicon Valley. They focus on emerging tech, real-world challenges and offer a global community, mentorship and unique opportunities for the members. The program isn't free however they offer financial aid and scholarships. The amount of exposure and mentorship one gets from this program is definitely worth the price.

My Study Life:

My Study Life is a great application that helps one manage their school year by helping him or her keep track of assignments and tests. It helps students plan ahead and stay on top of their schoolwork.

App Locks:

It is quite tempting to scroll through social media such as TikTok for hours and hours on end rather than to do homework. This is why it is great for students to invest in an app lock that will lock all distracting sites and applications while they study.

YouTube:

YouTube contains a vast collection of videos on various topics. Students can learn coding from channels such as Freecodecamp or watch a couple of videos on all sorts of topics from Crash Course. With over 3 billion videos on the platform and thousands more being uploaded daily it is safe to say that one can get a video on almost every topic. Just be careful to stay on track while using it, or you might find yourself watching hours' worth of dog videos.

There is no doubt that online learning can be a difficult challenge. However, to make the most of the virtual learning experience and make digital learning more manageable, there are many avenues for avid students.



Remote Jobs *In STEM*

Prudence Mutabari

Due to the imperative social distancing guidelines, many work from home. All that is required for professionals to work remotely is a strong internet connection. Sounds heavenly, doesn't it? There is no longer a need to commute to and from work on a daily basis, and there is more flexibility for how you schedule your time.

Remote working has become the new normal. Businesses that were able to adapt accordingly thrived in 2020, but those that struggled to transition faced great losses, and some even had to shut down.

The best thing about remote working, which is also the reason as to why it is so popular,



is the fact that people are able to choose how they would like to work. There are numerous advantages to working remotely. This is just a highlight of what are the best aspects to working from home.

Increased productivity: People who work remotely at least once a month are 24% more likely to be happy and productive. People are able to work when they feel most productive or creative, so they may be able to accomplish more work.

Less travel: Since people work from home, they spend significantly less time on the road.

Large talent pool: The number of people who work from home has increased by 140% since 2005. With the freedom that comes with remote working, one is able to be more creative and nurture talents in specific fields. Also, recruiters can find talented employees who live farther away.

Saving on equipment: Employers do not need to spend large sums of money on technological equipment, as the employees can use their own.

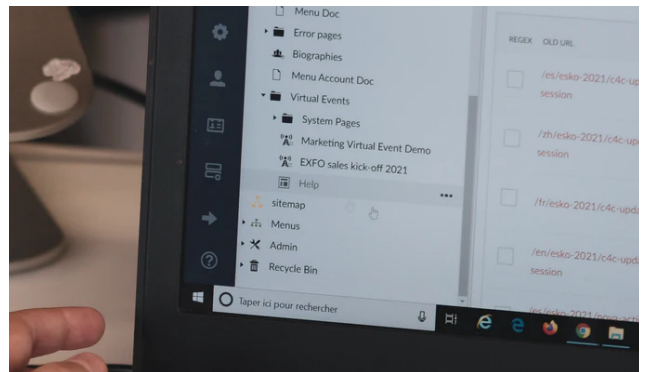
Mental health: Forty percent of people feel that the greatest benefit of remote work is the flexible schedule. Professionals are able to work on their mental health, for they are free to work at a pace that suits them. They can easily schedule breaks in between their work to focus on themselves.

Better service: This mostly applies to those who work one-on-one with their customers. They are able to meet with the client whenever it is convenient for the two of them, and the consultant is able to better understand the needs of the client - resulting in better goods and services.

Access to the job market is

unlimited: Sixteen percent of companies exclusively hire remote workers. Since remote workers get most of their jobs online, they have an unlimited job pool. Thanks to today's technology, one can meet with people from all over the world and work on various projects.

Much like any other alternative system, remote working too has its downfalls.



For instance, it is **easy to get distracted:** When working from home, one has to have self-discipline. Since people do not have anyone checking in on what they are doing nor are they working alongside others, it is up to them to create a conducive environment for working.

Lack of relationship with co-workers: It is difficult for workers of the same company to develop relationships while working remotely, as they hardly interact with each other. It is **difficult for employers to manage the employees** who work remotely: It is hard to evaluate their productivity because they cannot monitor their subordinates' progress in real time. **Lack of work/home balance:** Without having a definite workplace, some may find it hard to separate their work lives from their personal lives.

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Remote Jobs *In STEM (Continued)*

Prudence Mutabari

For those interested in working in STEM, below are some careers in which one can work remotely.

Software engineering:

This is a very broad field that includes web development and mobile app development. The job entails listening to your employers/ customers needs and implementing them in the application or website, which can be done remotely. It is no wonder that 35.5% of software engineers work fully remotely while 12% work partially remotely, whether freelance or for a single employer.

Data Science:

One will need specific training and computer language competencies. Data scientists use computing frameworks to analyze large, raw data sets and develop actionable insights in a variety of industries.

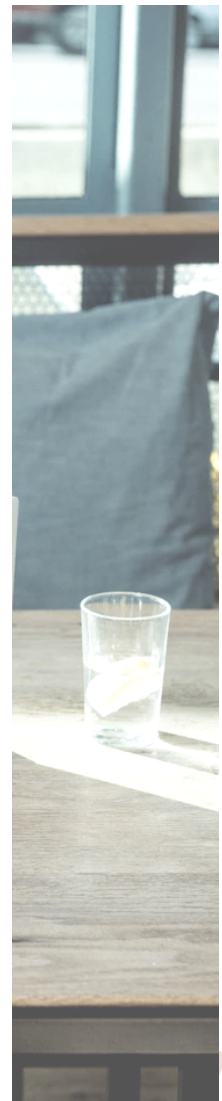
Web designer:

The job of a web designer is to design websites before they are made, that is the graphics, color schemes, layout, buttons, and more.

In order to work as a web designer you do not need to be in a physical space with others thanks to platforms such as zoom. The web designer can use such applications to talk to the customers and the app developers with ease.

Mechanical Engineering:

It is one of the broadest engineering fields. Mechanical engineers can easily work remotely as their job is to design and oversee the manufacture of different kinds of machines.



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However, they can not always work remotely full-time because overseeing the manufacturing process may require them to be at the company physically.

Chemical Engineering:

Chemical engineers design processes and equipment for large-scale manufacturing, plan and test production methods and byproducts treatment, and direct facility operations. As such they may choose to work partially remotely while designing the process but will need to work at a company's lab while testing out and manufacturing the products.

Computer Engineering:

They research, design, develop, and test computer systems and components. They may choose to work from home or work at co-working spaces in order to be able to better work with others on their various projects.

When we begin to return to normalcy, even though some will go back to the office, others will continue working from home. Remote jobs may continue to increase. When taking into consideration the various advantages and disadvantages of remote working, it is imperative for everyone to make career decisions that are right for them.



*“Careers in
which one can
work
remotely.”*

What has changed?

Rise in Online Meeting Platforms

**Joshua
Altman**

C OVID-19 has changed our daily lives so much, with one major adjustment being the limited exposure we have to other people. There has been a major increase in the use of online video services, people working from home, online school, and restricted travel. COVID-19 was an unprecedented circumstance, and the transition to a completely digital world was slow.

Many people have used the increased time at home to spend time with their family and to appreciate the people around them. Along with close family in the house, people have also used a lot of online meeting platforms to ‘see’ and talk to their family, who they might not talk to often. Being able to use the technology has helped the world stay connected when people are so far apart.

Online meeting platforms have also been used for working remotely. Being able to work from home has kept people connected and allowed for the economy of many countries to stay alive. Platforms such as Zoom, Microsoft Teams, and Google Meet have seen huge increases in users, and “Zoom usage has soared from 10 million daily meeting participants back in December to 300 million this month,” according to The Verge. With the significant increase in using the online meeting platforms, the stocks of those companies have also soared. Zoom stock has gone up an impressive 414% in the past year. Google Meet and Teams have seen minor increases as the online meeting platforms make up minor parts of their overall organization. The stock market has seen a wild ride this year.

With great change comes the question of how things would change if suddenly COVID-19 no longer became an immediate issue. Would we go back to sharing handshakes? Would more people start to work from home? Will school go back to in-person classes? It is difficult to predict where the world is headed, but one thing is for certain: things will never be exactly the same as before.





World Reactions to the Virus

Joshua Altman

C OVID-19 first brought fear to the world's eyes in January 2020. Back then, we had no idea how much destruction and terror it could cause to the world. Now, more than 1 year later with 96.2 million people worldwide being infected and 2.06 million deaths by the novel disease, we can find our lost hope, which we have been deprived of for so long.

In March 2020, we observed the global response to the novel disease which had been infecting people for months against our knowledge. The stock market began to crash as people sold their hope in big companies, planning for the end of the world. They bought out toilet paper, flour, sugar, wipes, bandaids, and other necessities.

The entire world was in immense fear, and people were speculating an apocalypse by the disease we could not stop. Historically, there has been a major virus every 100 years around this time in the century. In 1918, the Spanish flu hit the world causing “at least 50 million worldwide” deaths according to the CDC, in 1817 the first Cholera pandemic occurred. All of these factors caused major speculation and fear for people worldwide.

Now in January 2021, a lot of the world's resources have gone into creating a vaccine and a few have gone public. After lots of panic from the world about COVID-19, some people are hesitant about vaccination. As of mid-January, only 52 countries have distributed any COVID-19 vaccinations to their citizens according to Our World in Data. Not everyone in the world has a chance to get a vaccination, and many countries that have any are giving certain groups of people priority. In the US alone, “based on the recent rate, it might take a year—until January 2022—for every American to get at least one shot” according to the Wall Street Journal.

Usually, creating a vaccine for a virus and then testing that vaccine takes “5-10 years” according to the NC State University, and the vaccines which are becoming available to the public took around a year to complete that process.

“5-10 years” to create and test vaccine

Other people believe that COVID-19 is a hoax, as former President Donald Trump said in a rally “this is their new hoax,” in which he referred to the opposing political party, claiming that they created this virus for political gain. Additionally, many people are terrified of the side-effects and also potential long-term repercussions that could come from a vaccine and the injection. Many people suffer from a fear of needles, with even “at least 20 percent avoid any medical treatment as a result” according to PharmaJet. Others could face severe danger by taking the Pfizer-BioNTech vaccine because of severe allergic reactions that have arisen after the injection; some people have gone into anaphylaxis which could lead to death if untreated. Other people don’t want to get it because of the ‘herd immunity’ which could be created without some people getting the vaccination. “Herd immunity” is created when a large portion of the population is immune to a disease, which “many epidemiologists have offered has been 60 to 70 percent” for COVID-19 according to The New York Times.



Despite the hesitation, the majority of vaccinations, the two leading ones being Pfizer and Moderna vaccines, have around a 95% effectiveness in clinical trials. Many of the world leaders have backed the vaccine, as Israeli Prime Minister Benjamin Netanyahu said “I believe in this vaccine,” according to AP News. According to the BBC, British Prime Minister Boris Johnson said “it will gradually make a huge, huge difference.”

There is hope to be had for the new vaccines and the changing world reactions to the novel Coronavirus. Hopefully, the world continues the trend of taking the pandemic seriously, and people receive vaccinations when they can. For us to promptly return to the “normal” state we were in before the virus, our nations and their people need to work together.

Vaccines: Moderna and Pfizer







Devashree Gupta

We finally have not one - but two - vaccines to tackle COVID-19! Both the Moderna and Pfizer vaccines defied the laws of biotechnology, being made available to the general public a year after the birth of this novel virus. While there are several other vaccines being developed, Moderna and Pfizer were the first to be approved by the FDA and dispatched for use.

How do the Moderna and Pfizer vaccines work?









Both vaccines use mRNA. Essentially, mRNA is a molecule containing genetic information which transfers from the nucleus the coding for a protein (such as an antibody) to a ribosome within a cell. However for the COVID-19 vaccines, the mRNA inserted through the injection goes straight to the ribosomes of cells instead of originating from the nucleus. When the mRNA from the vaccine reaches the ribosome, it stimulates the ribosome to produce an immunogenic response. This is when protective functions like antibodies are produced to combat and kill the virus. The mRNA and protein produced by the ribosomes are destroyed by the antibodies, while the antibodies live on in the blood and lymph nodes, ready to destroy the covid-19 virus if it enters the body. Nevertheless, both the vaccines are short lived, and frequent shots must be given.

Although these vaccines have a 90% and above efficacy, they have not proven to prevent the infection itself. What this means is that the infection could still occur and be transmitted to other people, much like the asymptomatic state of the virus. Only when a vaccine does curtail the ability of the body to possess the infection, will transmissibility rates be reduced.

Moderna		Pfizer
Biotechnology company from Cambridge, Massachusetts.	 Produced by	Pharmaceutical company, Pfizer and bioNtech
100 micrograms	 Dosage	30 micrograms
Day one, followed by day 28	 Frequency of doses	Day one, followed by day 21
Lasts up to one month at 25 F	 Storage	Lasts upto only 5 days at 25 F but six months at -94 F
94%	 Efficacy rate	95%
30,000	 Trial subjects	19,000

There are several differences and similarities to consider between the vaccines, in relation to storage, frequency of dosage and the target population.

(Left and below) Infographic comparing Moderna and Pfizer vaccines

Humans 18 and older	 Age restrictions	Humans 16 and older
	 Safe for pregnant or lactating humans	
 White (Moderna, 150 million) vs Pfizer (Blue, 50 million) in number of vaccines to be provided		
Redness, swelling, or pain on site. Tiredness, migraine, nausea, fever. Muscle and joint pain.	 Short term side effects	Redness, swelling, or pain on site. Tiredness, migraine, nausea, fever. Muscle and joint pain. Swollen lymph nodes. The vaccine could cause an allergic reaction
Tromethamine Tromethamine hydrochloride Acetic acid Sodium acetate	 Ingredients	Potassium chloride Monobasic potassium phosphate Sodium chloride Sodium phosphate
100 doses	 Maximum vaccine order	150 doses

With the year starting with such hopeful results from Moderna, Pfizer and several other vaccines like Covishield, Covaxin and many more, there is hope that soon the world shall return to some semblance of normalcy. There is optimism to be had in 2021.

Games: Word search and Crosswords

You've made it! Thank you so much for reading until the end!
Answers are on the next page.

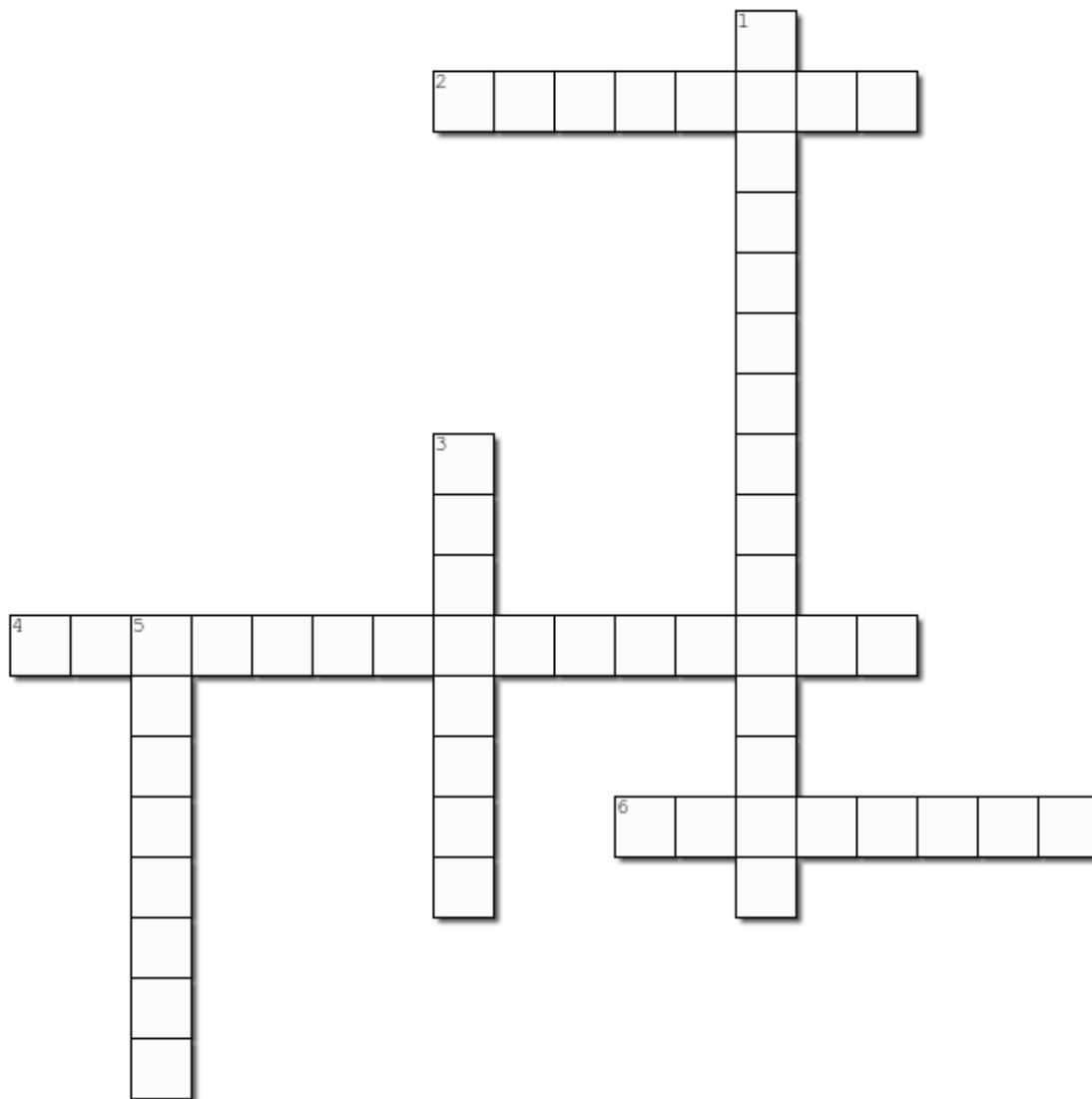
COVID-19 Word Search

C	O	N	T	A	G	I	O	U	S	S	S	E	L
E	I	I	M	T	I	R	E	D	N	E	S	S	T
C	S	R	Y	E	N	I	C	S	W	M	S	S	E
O	E	K	A	S	C	G	A	S	A	A	S	P	R
R	R	N	S	D	E	S	C	S	S	S	A	R	S
O	F	E	V	E	R	S	O	D	H	K	N	E	S
N	C	O	R	K	T	E	O	N	A	A	A	A	S
A	N	A	O	E	N	I	C	C	A	V	Y	D	S
V	R	R	E	A	M	A	S	I	I	I	O	Y	R
I	W	U	T	R	N	C	C	C	H	E	P	Y	R
R	C	L	E	A	N	C	H	G	A	T	T	S	S
U	A	C	A	S	T	E	U	O	O	R	V	Y	S
S	C	C	V	R	M	O	F	M	A	E	I	O	D
O	A	R	A	E	C	W	S	I	C	S	F	E	H

WASH
FEVER
SYMPTOMS
IYSESOCIETY
CONTAGIOUS
TIREDNESS
CORONAVIRUS
CLEAN
COUGH
VACCINE
MASK
SPREAD

IYSE Covid-19 Term Crossword

Complete the crossword puzzle below



Created using the Crossword Maker on TheTeachersCorner.net

Across

- 2. A sudden rise in the incidence of a disease
- 4. What to do if you see someone coming near you
- 6. An outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the populati

Down

- 1. Refrain from any contact with other individuals for a period of time
- 3. An outbreak of disease that spreads quickly and affects many individuals at the same time
- 5. The pandemic that we are in right now

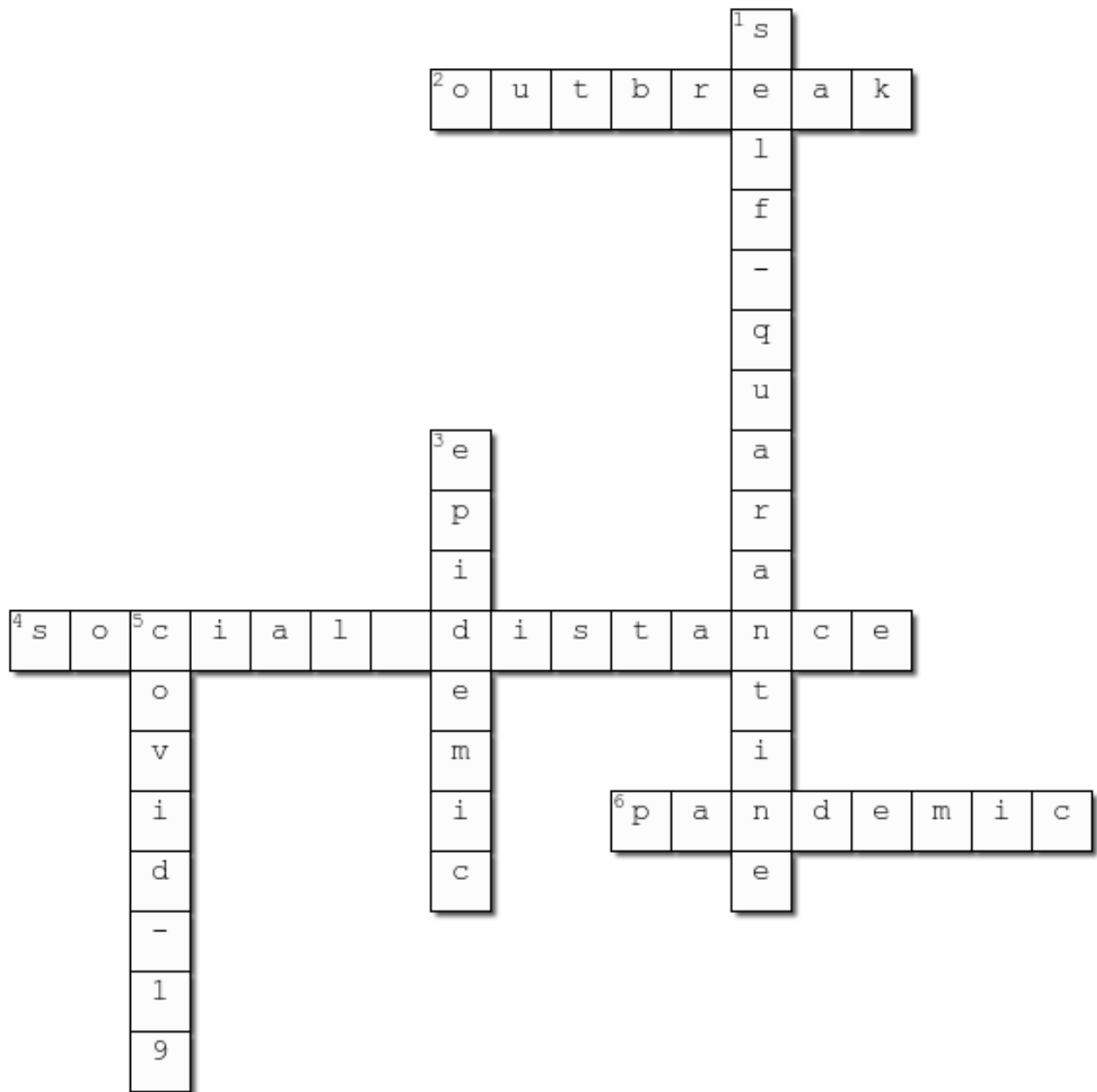
Answers: Word search and Crosswords

Did you get the answers right?



IYSE Covid-19 Term Crossword

Complete the crossword puzzle below



Created using the Crossword Maker on TheTeachersCorner.net

Across

2. A sudden rise in the incidence of a disease (**outbreak**)
4. What to do if you see someone coming near you (**social distance**)
6. An outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the populati (**pandemic**)

Down

1. Refrain from any contact with other individuals for a period of time (**self-quarantine**)
3. An outbreak of disease that spreads quickly and affects many individuals at the same time (**epidemic**)
5. The pandemic that we are in right now (**covid-19**)