МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ "ХАРКІВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ"

КАФЕДРА ІНОЗЕМНИХ МОВ

Методичні вказівки з англійської мови для самостійної роботи студентів 1 курсу спеціальностей «Інструментальне виробництво», «Металорізальні верстати та системи»

Methodological instructions in the English language for 1st year students' self-study in specialties Instrumental production, Cutting machine tools and systems

Харків

НТУ "ХПІ"

2024

Методичні вказівки з англійської мови для самостійної роботи студентів 1 року навчання спеціальностей Інструментальне виробництво, Металорізальні верстати та системи = Methodological instructions in the English language for 1st year students' self-study in specialties Instrumental production, Cutting machine tools and systems / уклад. Левін Є.Д., Левін О.Є. Харків НТУ „ХПІ". - 30 с.

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ЗМІСТ

ПЕРЕДМОВА

На сучасному етапі розвитку освіти іноземна мова є незамінним предметом для усіх здобувачів вищої світи. Неможливо уявити фахівця будь-якої спеціальності без знання іноземної мови, особливо англійської.

Дані методичні вказівки призначені для самостійної роботи студентів спеціальностей «Інструментальне виробництво», «Металорізальні верстати та системи», усі розділи присвячені проблемам, які пов'язані з ливарною справою та металорізальними процесами. Методичні вказівки складаються з трьох розділів, які є різноманітними за тематикою, але їх об'єднує те, що всі ці підтеми належать до однієї теми.

Слід зазначити, що самостійна робота студентів є невід'ємною частиною освітнього процесу. Згідно із системою ЄКТС дві третини навчання припадає на самостійну роботу студентів.

Завдання, запропоновані в методичних вказівках допомагають здобувачам освіти розвинути лексичну компетенцію. Окрім цього тексти для читання з аутентичних джерел, а саме видавництва «The New York Times» сприяє ефективному розвитку вміння читати і аналізувати прочитане.

Наявність ключів в кінці методичних вказівок дозволяє здобувачам освіти перевірити якість засвоєного матеріалу.
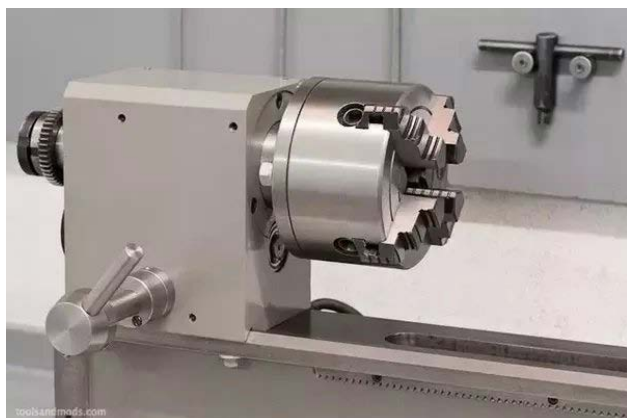
Методичні вказівки підходять здобувачам освіти, для яких металорізальні та ливарні спеціальності є профільними.

Unit 1. Machine tools/Металообробні верстати

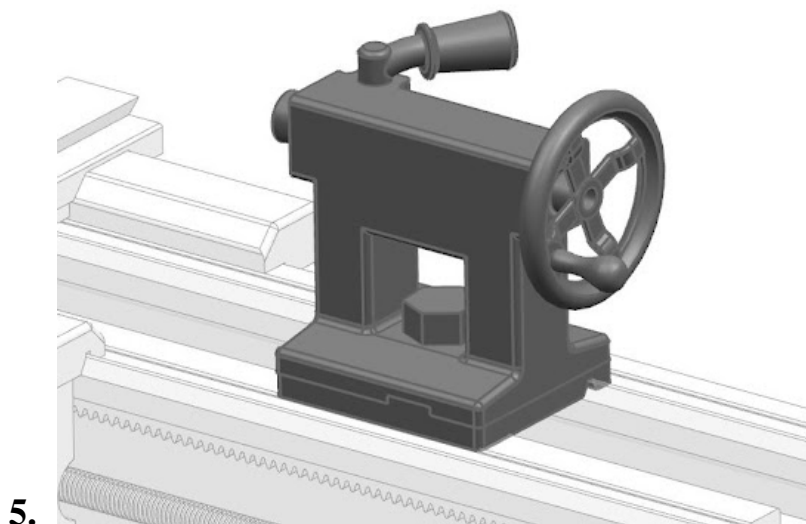**Task 1. Match the pictures with the names of the objects.**

1.

2.

3.

4.

5.

a	b	c	d	e
headstock	universal grinding machine	grinding wheel	tailstock	wheelhead slide

Task 2. Match the words with their translation.

1. headstock	a. універсальний шліфувальний верстат
2. universal grinding machine	b. задня (центруюча) бабка
3. grinding wheel	c. передня бабка
4. tailstock	d. полозки шліфувальної бабки

| 5. wheelhead slide | e. шліфувальне колесо |

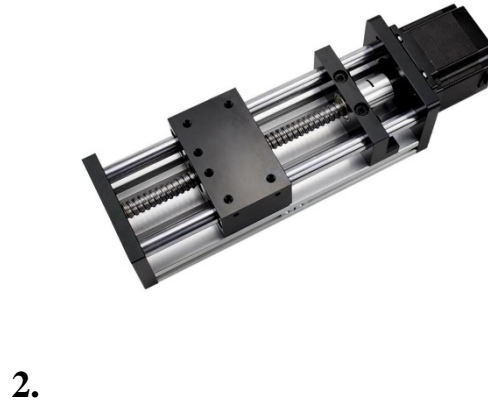**Task 3. Match the pictures with the names of the objects.**

1.

2.

3.

4.

5.

6.
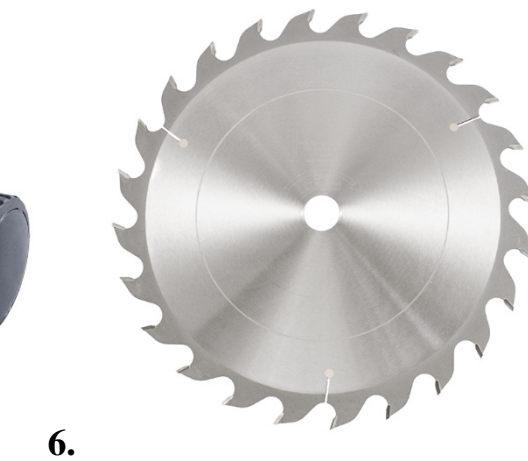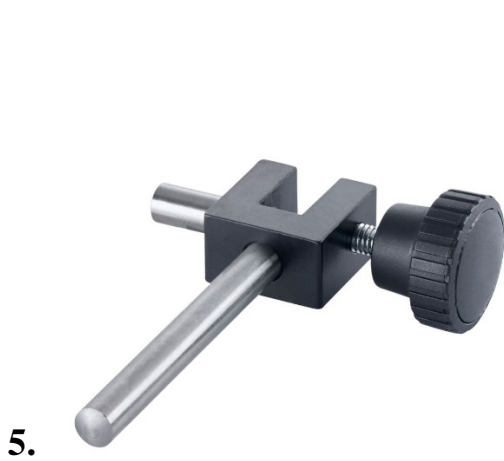
7.

8.

9.

10.

a	b	c	d	e
cross slide rail	hacksaw	clamping device	tool box	planer table

f	g	h	i	j
saw frame	bed base plate	block for workpiece	radial drilling machine	saw blade

Task 4. Match the words with their translation.

1. cross slide rail	a. ножівка
2. hacksaw	b. стіл
3. clamping device	c. пиляльна рама
4. tool box	d. радіально-свердлильний верстат
5. planer table	e. підставка для заготовки
6. saw frame	f. затискач

7. bed base plate	g. лезо ножівки
8. block for workpiece	h. різцетримач
9. radial drilling machine	i. фундаментна плита
10. saw blade	j. вертикальний супорт (поперечина)

Task 5. Read the article and do the tasks related to it.

In a warehouse off Lyndon B. Johnson Freeway in an industrial area outside Dallas, the future of American military ammunition production is coming online.

Here, in the Pentagon's first new major arms plant built since Russia invaded Ukraine, Turkish workers in orange hard hats are busy unpacking wood crates stenciled with the name Repkon, a defense company based in Istanbul, and assembling computer-controlled robots and lathes.

The factory will soon turn out about 30,000 steel shells every month for the 155-millimeter howitzers that have become crucial to Kyiv's war effort.

Ukraine fired between 4,000 and 7,000 such shells daily for several months in 2023, according to NATO's secretary-general, before infighting among House Republicans held up further funding for Pentagon arms shipments. Large shipments of American artillery ammunition resumed in April after Congress passed an aid package that included $61 billion to Ukraine.

The gap led to a drastic ammunition shortage for Kyiv, with Ukrainian troops able to fire only a fraction of the shells shot at them by Russian forces.

To keep Ukraine's artillery crews supplied, the Pentagon set a production target last year of 100,000 shells per month by the end of 2025. Factories in Scranton and Wilkes-Barre, Pa., together make about 36,000 shells per month. The new General Dynamics facility in Mesquite, Texas, will make 30,000 each month once it reaches its full capacity.

The 100,000-per-month goal represents a nearly tenfold increase in production from a few years ago.

An Ohio-based defense firm called IMT is expected to make up the difference.

Less than a year ago, the surrounding area here in North Texas was just a dirt field. But with millions of dollars from Congress and help from Repkon, the American defense firm General Dynamics was able to open the factory about 10 months after breaking ground.

"Despite all our starts and stops with the government, the continuing resolutions and getting the last supplemental package, the industrial base responds when you fund it and it's done right," William A. LaPlante, the Pentagon's top acquisition official, said in an interview with his Army counterpart, Douglas R. Bush.

According to Mr. LaPlante, the United States has provided more than three million 155-millimeter shells to Kyiv since the war began in February 2022.

"When government and industry work together and Congress gives us sufficient latitude, we can still do great things in this country really fast," Mr. Bush added.

Whether the increase in artillery ammunition production alone will be enough to change outcomes on the battlefield in Ukraine's favor is, however, unknown.

"The steady increase of artillery ammunition production is significant for long-term U.S. and Ukrainian needs," said Michael Kofman, an expert on the Russian military and a senior fellow at the Carnegie Endowment for International Peace, "but even in the best case scenario, I would say those late-2025 output targets will arrive late in this war, and it is likely that Russian artillery output will still be higher than the U.S. and Europe combined at that point."

"Let's say a year and a half from now both the U.S. and Europe are making, or buying, over a million shells each," he added. "That's still probably less than Russia is going to produce this year."

The Mesquite factory will consist of three production lines in different buildings — one of which will share space with a distribution center for Frito-Lay that had a Cheetos-branded truck parked outside. When all three lines are completed, most of the Turkish workers will go home.

Half of the on-site American work force came from another General Dynamics plant about 10 miles north in Garland, where the company forges steel casings for aerial bombs. The Mesquite factory will add about 350 jobs to the local economy when it reaches its full production capacity next year, company officials said.

(Taken from the New York Times)

**Task 6. Match the highlighted words with their translation.**

1. ammunition	a. пакет допомоги
2. funding	b. потужність, потенціал
3. capacity	c. авіаційні бомби
4. supplemental package	d. боєприпаси
5. sufficient latitude	e. достатня широта
6. aerial bombs	f. фінансування

Task 7. Answer if the statements are true or false.

	T	F
1. The workers' clothes are not mentioned in the article.		
2. The plant will produce more than 29 000 shells every month soon.		
3. Ukraine fired less than 4000 shells daily in 2023.		
4. The gap in funding had awful consequences.		
5. Mr. LaPlante doesn't know the number of shells provided to Kyiv.		
6. The Mesquite factory might add about 350 jobs to the local economy.		

Unit 2. Iron and steel works/Чорна металургія та сталеливарне виробництво

Task 1. Take a look at the picture of an oxygen-blowing converter (Кисневий конвертер) and match the letters to the numbers.
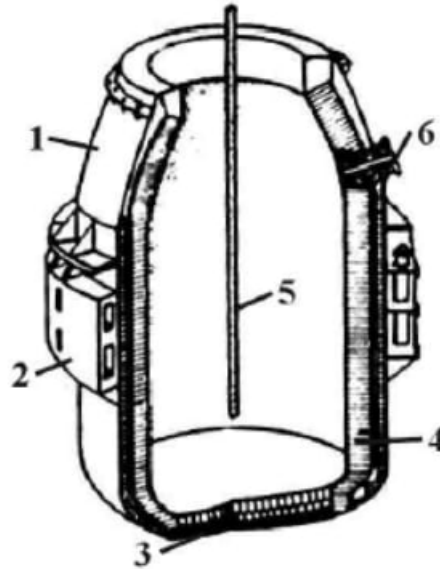

a	b	c	d	e	f
solid converter bottom	tapping hole	oxygen lance	conical converter top	fireproof lining	mantle

Task 2. Match the words with their translation.

1. solid converter bottom	a. отвір для зливу
2. tapping hole	b. горловина
3. oxygen lance	c. монолітне дно конвертора
4. conical converter top	d. опорне кільце
5. fireproof lining	e. вогнетривка футерівка
6. mantle	f. киснева фурма

Task 3. Take a look at the picture of a Siemens electric low-shall furnace (Електрична піч Сіменса) and match the letters to the numbers.

a	b	c	d
runout	electrodes	bustle pipe	feed
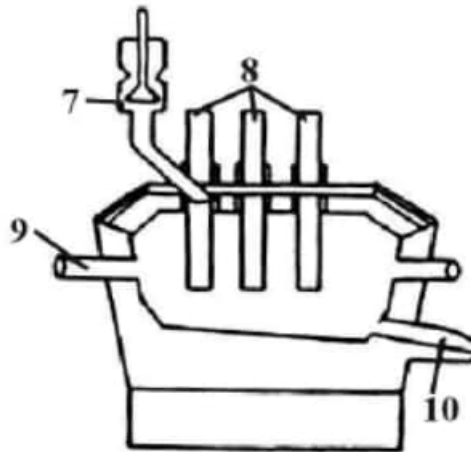
Task 4. Match the words with their translation.

1. runout	a. повітропровід гарячого дуття
2. electrodes	b. випуск
3. bustle pipe	c. завантаження шихти
4. feed	d. електроди

Task 5. Read the article and do the tasks related to it.

At the Carnegie Museum of Art, an installation by the artist Marie Watt celebrates the region's industrial history with I-beams and glass.

If there is one word that defines Pittsburgh, it is steel.

Steel is in Pittsburgh's DNA. It's embedded in the name of the city's football team and is the source of the industrial wealth that put Pittsburgh on the map.

This month, steel is being celebrated in a different way at the city's Carnegie Museum of Art. As part of its Forum Series of commissioned art from living artists, the museum will present "Land Stitches Water Sky," a multiton sculpture of steel by the interdisciplinary artist Marie Watt that explores the region's industrial history with I-beams and glass. The exhibit opened April 13 and will be on display until Sept. 22.

Watt was selected because of her use of objects to tell stories and her willingness to work in partnership with the museum to produce a new and ambitious work of art, said Eric Crosby, the museum's director since 2020, in an interview in New York. "We gravitated to her and her to us,'' he said.

Watt, a member of the Seneca Nation, tries through her work to connect the past with the present and to find links among disparate communities. Steel fits right in with her vision: It was steel from Pittsburgh that helped build the Empire State Building and the George Washington Bridge in New York, and many other famous structures. And it was Mohawk Native Americans, who have been celebrated in her

past works, who worked on many of those projects, earning them the <mark>moniker</mark> "skywalkers" for their daring feats on steel beams.

"We are looking at the intersection of steel and Pittsburgh history," Watt said in a video interview. "After learning more about the industry and its origins in Pittsburgh, I've been thinking more about the impact of steel on the community here and how it intersects with my own understanding."

That connection will be represented in the two arc-shaped collections of steel I-beams, over 20 feet long and weighing thousands of pounds, that allow viewers to walk through and contemplate a "word bank" from local poets etched into the steel. In addition, there are several glass I-beams in recognition of Pittsburgh's equally important past as a center of industrial glassmaking.

As <mark>welders</mark> construct the structure, local poets have been adding words that will appear on the beams: silence, bear, sky, auntie, water, homestead, lantern, heirloom, elder.

Known for her formations of <mark>stacked</mark> and folded blankets piled up to dizzying heights, Watt will be displaying an array of blankets near the steel piece. "Blankets are parts of people's lives," she said. "They are stories and memories. Blankets are humble and simple and yet can have so much meaning and power. Blankets are cinematic in scale, like a billboard, and can envelop the viewer in the material.''

(Taken from the New York Times)

**Task 6. Match the highlighted words with their translation.**

1. willingness	a. різнорідний, розрізнений
2. disparate	b. укладений
3. moniker	c. зварювальники
4. welders	d. готовність, бажання, прагнення
5. stacked	e. прізвисько
6. I-beams	f. двотаврові балки

Task 7. Answer if the statements are true or false.

	T	F
1. Pittsburgh's DNA includes metals.		
2. Marie Watt is a composer.		
3. The exhibition will finish not earlier than October 1.		
4. As welders construct the structure, local poets have been adding various words that will appear on the beams.		
5. The connection between Pittsburgh and steel will be shown in a new collection.		

Unit 3. Iron foundry and rolling mill/ Чавуноливарний завод та прокатний стан

Task 1. Take a look at the picture of an iron foundry (чавуноливарний цех) and match the letters to the numbers.
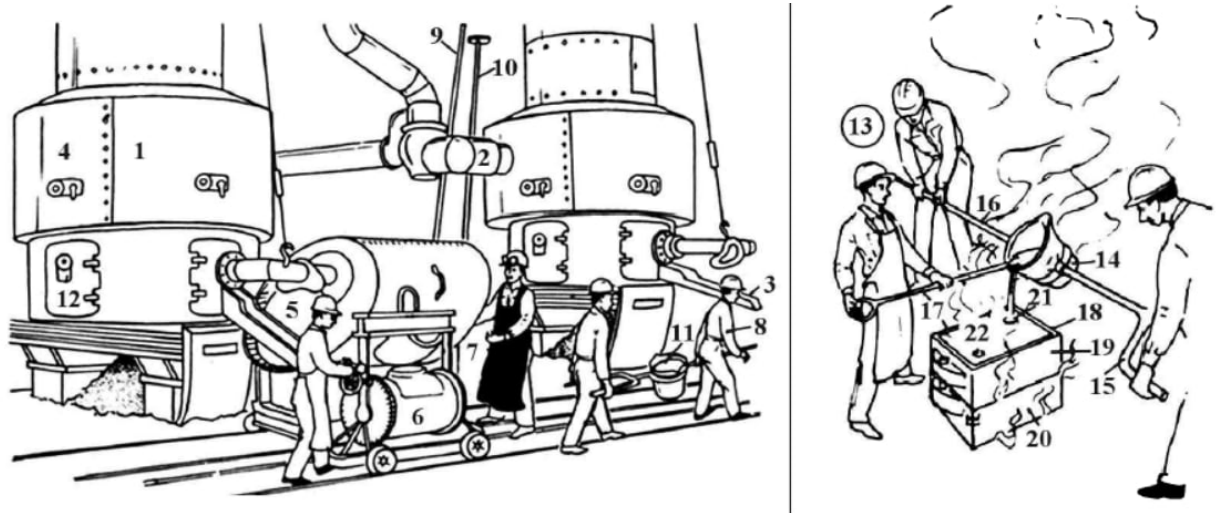
a	b	c	d	e
tapping spout	melter	cupola furnace	founder	tilting-type hot-metal receiver

f	g	h	i	j
bott stick	spyhole	mobile drum-type ladle	tap bar	blast inlet

k	l	m	n	o
slag spout	closed moulding box	molten iron	carrying bar	hand shank

p	q	r	s	t
double handle	lower frame	casting team	upper frame	skimmer rod

u	v
riser	runner

Task 2. Match the words with their translation.

1. tapping spout	a. ливарник
2. melter	b. пересувний барабанний ливарний ківш
3. cupola furnace	c. шлаковий жолоб
4. founder	d. несучий пруток
5. tilting-type hot-metal receiver	e. ручний ливарний ківш
6. bott stick	f. плавильна піч
7. spyhole	g. бригада відливки
8. mobile drum-type ladle	h.закрита опока
9. tap bar	i. верхня напівформа
10. blast inlet	j. лопатка для скачування шлаків
11. slag spout	k. перекидний накопичувач рідкого чавуна
12. closed moulding box	l. отвір у верхній частині опоки
13. molten iron	m.трубопровід повітродувки
14. carrying bar	n. хомут з ручками для переноски
15. hand shank	o. рідкий чавун
16. double handle	p.ливниковий канал
17. lower frame	q. плавильник
18. casting team	r. нижня напівформа
19. upper frame	s. глиняна пробка на стрижні
20. skimmer rod	t. оглядове вічко
21. riser	u. лом для пробиття льотки
22. runner	v. випускний жолоб

Task 3. Take a look at the picture of a blast furnace plant (доменний цех) and match the letters to the numbers.
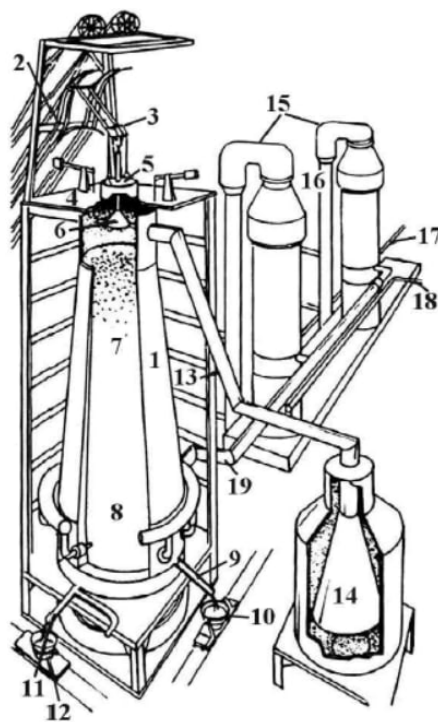
a	b	c	d	e
furnace incline for ore	charging platform	skip hoist	receiving hopper	blast furnace

f	g	h	i	j

slag escape	blast furnace shaft	slag ladle	smelting section	bell

k	l	m	n	o
downtake	hot-blast stove	pig iron runout	dust catcher	pig iron ladle

p	q	r	s
gas pipe	pot-blast pipe	blast main	external combustion chamber

Task 4. Match the words with their translation.

1. furnace incline for ore	a. скіповий підйомник
2. charging platform	b. випуск шлаків
3. skip hoist	c. вертикальний канал
4. receiving hopper	d. каупер
5. blast furnace	e. горн
6. slag escape	f. домна, шахтна піч
7. blast furnace shaft	g. шлаковозний ківш

8. slag ladle	h. виносна камера горіння
9. smelting section	i. підйомник для руди
10. bell	j. випуск переробного чавуна
11. downtake	k. пиловловлювач
12. hot-blast stove	l. завантажувальний майданчик
13. pig iron runout	m. магістральний трубпровід
14. dust catcher	n. трубопровід гарячого дуття
15. pig iron ladle	o. шахта печі
16. gas pipe	p. газова труба
17. pot-blast pipe	q. приймальна лійка
18. blast main	r. великий конус
19. external combustion chamber	s. чавунорізний ківш

Task 5. Read the following article and do the tasks related to it.

A.I. Is Coming for Lawyers, Again

Previous advances in A.I. inspired predictions that the law was the lucrative profession most likely to suffer job losses. It didn't happen. Is this time different?

More than a decade ago, lawyers were singled out as an endangered occupational species, their livelihoods at risk from advances in artificial intelligence.

But the doomsayers got ahead of themselves. While clever software has taken over some of the toil of legal work — searching, reviewing and mining mountains of legal documents for nuggets of useful information — employment in the legal profession has grown faster than the American work force as a whole.

Today, a new A.I. threat looms, and lawyers may feel a bit of déjà vu. There are warnings that ChatGPT-style software, with its humanlike language fluency, could take over much of legal work. The new A.I. has its flaws, notably its proclivity to make things up, including fake legal citations. But proponents insist those are teething defects in a nascent technology — and fixable.

Will the pessimists finally be right?

Law is seen as the lucrative profession perhaps most at risk from the recent advances in A.I. because lawyers are essentially word merchants. And the new technology can recognize and analyze words and generate text in an instant. It seems ready and able to perform tasks that are the bread and butter of lawyers.

"That is really, really powerful," said Robert Plotkin, an intellectual property lawyer in Cambridge, Mass. "My work and my career has been mostly writing text."

But unless the past isn't a guide, the impact of the new technology is more likely to be a steadily rising tide than a sudden tidal wave. New A.I. technology will change the practice of law, and some jobs will be eliminated, but it also promises to make lawyers and paralegals more productive, and to create new roles. That is what happened after the introduction of other work-altering technologies like the personal computer and the internet.

One new study, by researchers at Princeton University, the University of Pennsylvania and New York University, concluded that the industry most exposed to the new A.I. was "legal services." Another research report, by economists at Goldman Sachs, estimated that 44 percent of legal work could be automated. Only the work of office and administrative support jobs, at 46 percent, was higher.

Lawyers are only one occupation in the path of A.I. progress. A study by researchers at OpenAI, the creator of ChatGPT, and the University of Pennsylvania found that about 80 percent of American workers would have at least 10 percent of their tasks affected by the latest A.I. software.

The legal profession has been identified as a ripe target for A.I. automation in the past. In 2011, one article in a longer series in The New York Times on the progress in A.I. (titled "Smarter Than You Think") focused on the likely impact on legal work. Its headline: "Armies of Expensive Lawyers, Replaced by Cheaper Software."

But the march of A.I. in law turned out to be more measured. A.I. mainly identified, sorted and classified words in documents. The technology's tools served more as aides than as replacements — and the same could be true this time.

In 2017, Baker McKenzie, a large international law firm, set up a committee to track emerging technology and set strategy. Since then, the A.I. software has made steady inroads.

"The reality is A.I. has not disrupted the legal industry," said Ben Allgrove, a partner at the firm and its chief innovation officer.

The rapid progress in large language models — the technology engine for ChatGPT — is a significant advance, Mr. Allgrove said. Reading, analyzing and summarizing, he said, are fundamental legal skills. "At its best, the technology seems like a very smart paralegal, and it will improve," he said.

The impact, Mr. Allgrove said, will be to force everyone in the profession, from paralegals to $1,000-an-hour partners, to move up the skills ladder to stay ahead of the technology. The work of humans, he said, will increasingly be to focus on developing industry expertise, exercising judgment in complex legal matters, and offering strategic guidance and building trusted relationships with clients.

Technology has eliminated large numbers of jobs in recent years, and not just robots taking over factories. Personal computers, productivity software and the internet have made office work more efficient, replacing many workers.

Office and administrative support occupations, including secretaries, clerks, bill collectors and office assistants, employ 1.3 million fewer workers than in 1990, according to an analysis by the Bureau of Labor Statistics. The Labor Department forecasts further decline, with 880,000 fewer jobs in those occupations by 2031.

"Technology is a driver, and there are large changes, but they tend to come gradually over a decade or more," said Michael Wolf, the division chief for occupational employment projections at the Bureau of Labor Statistics.

The bureau's current outlook is that jobs for lawyers and paralegals will continue to grow faster than the labor market as a whole. Mr. Wolf is closely watching the arrival of the new A.I. software, but he said it was too early to assess what the technology's long-term impact would be.

Lawyers are mostly putting the technology through test runs. The issues of data protection and client confidentiality are critical in legal work. The legal profession resisted using email until information-handling rules were established.

And the software models' tendency to make up things confidently is alarming — and an invitation to malpractice suits — in a profession that hinges on finding and weighing facts.

To help address those concerns, law firms often use software that runs on top of something like ChatGPT and is fine-tuned for legal work. The tailored software has been developed by legal tech start-ups like Casetext and Harvey.

Load in a case's documents and ask the software to draft deposition questions, for example, and in a few minutes it will spit out a list of pertinent questions, lawyers say.

"For the things it can do well, it does them stunningly well," said Bennett Borden, a partner and the chief data scientist at DLA Piper, a large corporate law firm.

Successfully using the A.I. requires ample relevant data and questions that are detailed and specific, Mr. Borden said. More open-ended questions, like what's the most important evidence, or who are the most credible witnesses, are still a struggle for the A.I.

Lawyers at big firms have seen significant time savings for certain jobs and view the technology as a tool to make teams of lawyers and paralegals more productive. Sole practitioners see the technology more as a partner in practice.

Valdemar L. Washington, a lawyer in Flint, Mich., was selected last fall to test the software from Casetext, called CoCounsel, which works with the latest ChatGPT technology.

Mr. Washington used the software in a suit against the City of Flint claiming that residents were overcharged on water and sewer rates and service fees. He loaded more than 400 pages of documents, and the software quickly reviewed them and wrote a summary that pointed him to an important gap in the defense's case.

The program did in a few minutes what would have taken him several hours, he said.

"It's a real game changer," Mr. Washington said.

But how much the legal profession will change, and how soon, is uncertain.

The new A.I. is a challenge to the status quo. Higher productivity means fewer billable hours, yet hourly billing remains the dominant business model in legal work. A.I. should increase the pressure from corporate clients to pay law firms for work done rather than time spent. But top corporate legal officers — the customers — are typically former partners and associates in big law firms, steeped in the same traditions.

"There is a huge opportunity for A.I. in legal services, but the professional culture is very conservative," said Raj Goyle, an adviser to legal tech companies and a Harvard Law School graduate. "The future is coming, but it will not be as fast as some predict."

(Taken from the New York Times)

Task 6. Answer if the statements are true or false.

	T	F
1. Less than 10 years ago lawyers were believed to lose their jobs.		
2. The new generation of artificial intelligence poses a new threat to lawyers.		
3. The research conducted by the Princeton University stated that law is at risk of being replaced by AI faster than other professions.		
4. Baker McKenzie is a selling company.		
5. There will be no office workers left by 2031		
6. The degree of future lawyers' substitution is unknown yet.		

KEYS

Unit 1

Task 1

a	b	c	d	e
headstock	universal grinding machine	grinding wheel	tailstock	wheelhead slide
2	1	4	5	3

Task 2

1	2	3	4	5
c	a	e	b	d

Task 3

a	b	c	d	e
cross slide rail	hacksaw	clamping device	tool box	planer table
2	4	5	3	1

f	g	h	i	j
saw frame	bed base plate	block for workpiece	radial drilling machine	saw blade
7	9	10	8	6

Task 4

1	2	3	4	5	6	7	8	9	10
j	a	f	h	b	c	i	e	d	g

Task 6

1	2	3	4	5	6
d	f	a	e	c	b

Task 7

1	2	3	4	5	6

F	T	F	T	F	T

Unit 2

Task 1

a	b	c	d	e	f
solid converter bottom	tapping hole	oxygen lance	conical converter top	fireproof lining	mantle
3	**6**	**5**	**1**	**4**	**2**

Task 2

1	**2**	**3**	**4**	**5**	**6**
c	a	f	b	e	d

Task 3

a	b	c	d
runout	electrodes	bustle pipe	feed
10	8	9	7

Task 4

1	**2**	**3**	**4**
b	d	a	c

Task 6

1	**2**	**3**	**4**	**5**	**6**
d	**a**	**e**	**c**	**b**	**f**

Task 7

1	**2**	**3**	**4**	**5**
F	**F**	**F**	**T**	**T**

Unit 3

Task 1

a	**b**	**c**	**d**	**e**

tapping spout	melter	cupola furnace	founder	tilting-type hot-metal receiver
3	7	1	8	5

f	**g**	**h**	**i**	**j**
bott stick	spyhole	mobile drum-type ladle	tap bar	blast inlet
10	4	6	9	2

k	**l**	**m**	**n**	**o**
slag spout	closed moulding box	molten iron	carrying bar	Hand shank
12	18	11	16	14

p	**q**	**r**	**s**	**t**
double handle	lower frame	casting team	upper frame	skimmer rod
15	20	13	19	17

u	**v**
riser	runner
22	21

Task 2

1	**2**	**3**	**4**	**5**
v	q	f	a	k

6	**7**	**8**	**9**	**10**
s	t	b	u	m

11	**12**	**13**	**14**	**15**
c	h	o	d	e

16	**17**	**18**	**19**	**20**
n	r	g	i	j

21	22
l	p

Task 3

a	b	c	d	e
furnace incline for ore	charging platform	skip hoist	receiving hopper	blast furnace
2	4	3	5	1

f	g	h	i	j
slag escape	blast furnace shaft	slag ladle	smelting section	bell
9	7	10	8	6

k	l	m	n	o
downtake	hot-blast stove	pig iron runout	dust catcher	pig iron ladle
13	15	11	14	12

p	q	r	s
gas pipe	pot-blast pipe	blast main	external combustion chamber
18	19	17	16

Task 4

1	2	3	4	5	6	7	8	9	10
i	l	a	q	f	b	o	g	e	r

11	12	13	14	15	16	17	18	19
c	d	j	k	s	p	n	m	h

Task 6

1	2	3	4	5	6
F	T	T	F	F	T

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