

Chapter 6. Notable Scientific Artifacts in Korean History

WORD	MEANING	WORD	MEANING
1 revolutionary	혁명적인, 획기적인	21 excellence	뛰어남, 탁월함
2 technology	(과학) 기술	22 freezer	냉동고
3 booklet	작은 책자, 소책자	23 refrigerator	냉장고, 냉각 장치
4 gunport	(군함의) 보문, 총안	24 significant	커다란, 중요한
5 artifact	인공 유물; 인공물, 공예품	25 screen	가리다; 검진하다; 영화
6 pound	치다, 두드리다	26 granite	화강암
7 wrinkle	주름	27 feature	특색, 특징, 특성
8 royal guard	근위병	28 hollow	(속이) 빈
9 ceremony	의식, 식	29 movable	이동시킬 수 있는, 움직이는
10 attraction	명소; 끌림; 매력	30 sundial	해시계
11 sew	바느질하다, 깎다	31 reign	통치 기간, 치세
12 decoration	장식품; 장식	32 portray	그리다, 묘사하다
13 instrument	악기; 기구	33 corresponding	~에 해당하는, 상응하는
14 heritage	유산	34 indicate	가리키다; 나타내다
15 display	전시, 진열; 전시하다	35 royal	(여)왕의, 왕족의
16 sophisticated	정교한; 수준 높은; 세련된	36 ironclad	철갑의
17 ventilate	환기하다; 표명하다	37 warship	전함, 군함
18 illiterate	글을 모르는, 문맹의	38 mobility	기동성; 유동성
19 notable	주목할 만한, 눈에 띄는	39 invisible	보이지 않는, 볼 수 없는
20 advancement	발전, 진보	40 accuracy	정확, 정확도

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	WORD	MEANING		WORD	MEANING
41	flexibility	유연성; 융통성			
42	unsuspecting	의심하지 않는			
43	publish	출판하다, 발행하다			
44	remains	유적; 나머지			
45	principle	원리, 원칙			
46	majority	다수			
47	preserve	보존하다, 관리하다; 지키다			
48	primarily	주로			
49	get rid of	~을 없애다			
50	as a matter of fact	사실상			
51	cool off	식히다, 서늘하게 하다			
52	at the center of	~의 가운데에			
53	point to	가리키다			
54	a great volume of	다량의			
55	take a look at	~을 보다			
56	break down	고장나다			
57	be made up of	~로 구성되다			
58	push out	밀어내다, 몰아내다			
					
					

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1 revolutionary		21 excellence	
2 technology		22 freezer	
3 booklet		23 refrigerator	
4 gunport		24 significant	
5 artifact		25 screen	
6 pound		26 granite	
7 wrinkle		27 feature	
8 royal guard		28 hollow	
9 ceremony		29 movable	
10 attraction		30 sundial	
11 sew		31 reign	
12 decoration		32 portray	
13 instrument		33 corresponding	
14 heritage		34 indicate	
15 display		35 royal	
16 sophisticated		36 ironclad	
17 ventilate		37 warship	
18 illiterate		38 mobility	
19 notable		39 invisible	
20 advancement		40 accuracy	

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44	remains				
45	principle				
46	majority				
47	preserve				
48	primarily				
49	get rid of				
50	as a matter of fact				
51	cool off				
52	at the center of				
53	point to				
54	a great volume of				
55	take a look at				
56	break down				
57	be made up of				
58	push out				
					
					

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1. 접속사 as

 Concept

- as가 명사와 결합하면 <-로서>라는 의미로 간단하지만, 문장을 이어주는 역할을 하게 되면 의미가 다양해진다.
- 1. ~만큼, ~과 마찬가지로
- 2. ~과 같이, ~처럼, ~한 대로
- 3. (어떤 일이 일어나는) 동안에, ~하고 있을 때
- 4. ~해서, ~하므로, ~ 때문에
- 5. ~이긴 하지만

 Example Sentences

⊗ 해당 문장의 as용법이 무엇인지 판별하여 해석하세요.

1. Happy as he was, there was something missing.

= [해석]  
.....

2. Be patient with your puppy as he adjusts to his new home.

= [해석]  
.....

3. James decided not to go out as he was still really tired.

= [해석]  
.....

4. I can't run nearly as fast as I used to.

= [해석]  
.....

5. Leave things as they are until the police come.

= [해석]  
.....

6. A small stick created a shadow which moved as the sun rose and set.

= [해석]  
.....

7. It became colder as we went up higher on the mountain.

= [해석]  
.....

8. As it was a New Year's holiday, all the banks were closed.

= [해석]  
.....

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2. 사역동사

 Concept

- 목적어가 그 목적어만의 동사를 가질 수 있도록 하는 역할의 동사이다.

make	목적어	R.V
have		R.V / to V
let		
help		to V
ETC.		

- 특히 **make / have / let**은 목적보어가 동사원형인 것에 주의를 해야 하며 목적어와 목적보어가 어떤 관계에 있는지 확인을 잘해야 한다.

- 사역동사의 능동 [목적어가 행동을 취하는 경우]

: S + V + 목적어 + 동사원형

- 사역동사의 수동 [목적어가 행동을 받는 경우]

: S + V + 목적어 + 과거분사

 Example Sentences

⊗ 괄호 속에서 알맞은 단어를 고르고 해석하세요.

1. I just had my car [check/checked].

= [해석]

2. Could I get my nails cut and [shape/shaped]?

= [해석]

3. The geobukseon had its gunports [station/stationed] at its head and tail.

= [해석]

4. Since I have a meeting tomorrow, I have to get my report [done/do] tonight.

= [해석]

5. I had him [repair/repared] my car at the repair shop.

= [해석]

6. I' m going to get my hair [cut/to cut] tomorrow morning.

= [해석]

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### Notable Scientific Artifacts in Korean History

Today, Korea is known for its sophisticated technology and advancements in science.

As a matter of fact, Koreans had achieved scientific excellence many centuries ago.

A large number of scientific artifacts in Korean history have proven that Koreans have been gifted in science.

Let's explore the wisdom of our ancestors by learning about some major Korean scientific heritage.

### Seokbinggo, a Freezer Made of Rocks

Invented in the period of the Three Kingdoms, the seokbinggo was used as a "natural" refrigerator by our ancestors until the invention of the modern refrigerator.

When you go inside the seokbinggo on a warm day, you'll feel a significant temperature drop.

The seokbinggo was a remarkable technological invention that had several clever devices to screen itself from the heat.

First, the underground structure of the seokbinggo helped keep a low temperature inside.

Further, its floor, walls, and ceiling were made of granite, which cooled off the heat well.

The most notable feature of the seokbinggo was the ceiling.

The seokbinggo was designed to make warm air gather into its hollow part and leave the storage through the ceiling which had ventilating holes with tiny roofs to keep the rain from entering inside.

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One of the most useful purposes of the seokbinggo was to store ice.

When a nearby river froze in the winter, ice was collected and stored in it.

The ice was used to keep food offerings fresh for important ceremonial services.

Sometimes, the ice was also shared with the sick and elderly, as well as high-ranking officials.

### Angbuilgu, a Unique Clock From the Joseon Dynasty

The angbuilgu was a movable sundial that people used to accurately tell time during the Joseon Dynasty.

It was developed by three scientists- Jang Yeongsil, Lee Cheon, and Kim Jo- in the 16th year of King Sejong's reign (1434).

A small stick at the center of the angbuilgu created a shadow which moved as the sun rose and set.

The shadow pointed to a certain time marking on the angbuilgu which showed the time of day.

The angbuilgu also showed 24 periods of the solar calendar year by measuring the length of a shadow changing across seasons.

King Sejong's love for his people was reflected in this invention.

He portrayed the pictures of 12 animals on the angbuilgu which greatly helped his illiterate people check the corresponding time of a day.

The 12 pictures indicated by the shadow easily showed them what part of a day they were in.

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For use by common people, King Sejong kindly put the sundial in front of Jongmyo and on the Hyejeong Bridge in the downtown area of Jongno, as well as in the royal court.

### The geobukseon, the World' s First Ironclad Warship

The geobukseon is the first ironclad warship in the world.

Under the direction of Admiral Yi Sunsin, the geobukseon proved an important instrument for winning battles at sea, showing great power and mobility.

What makes this ship such an excellent scientific achievement?

It was specially designed so sailors could see their enemies outside while they remained invisible.

Unlike other warships, the geobukseon had its gunports stationed not only along its sides, but also at the head and tail of the ship.

This allowed sailors to fire cannons from all sides of the ship with great accuracy and flexibility of range.

Moreover, during battles, the spikes on the roof were hidden with straw mats so unsuspecting enemies would get hurt if they tried to board the ship.

The geobukseon still remains a wonder among warship building specialists.

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### Jikjisimcheyojeol, a Revolution in Publishing

The first movable metal type print in the world was invented during the Goryeo Dynasty.

This invention made it possible to print a great volume of books quickly.

Before it was invented, wooden block printing was the common method to publish books, but it could only print limited books in limited runs.

Jikji, a collection of Buddhist teachings, is the oldest book printed by the movable metal type.

It was published in 1377 in Heungdeok temple, 78 years before the famous 42-line Bible was published by Gutenberg in Europe.

UNESCO confirmed that Jikji was the oldest book printed with the use of movable metal type.

On September 4th, 2001, Jikji was registered in the "Memory of the World Prize" by this organization.

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해석도 적어보세요.

## Notable Scientific Artifacts in Korean History

Today, Korea is known [as/for] [its/their] sophisticated technology and advancements in science.

As a matter of fact, Koreans [has/had] achieved scientific excellence many centuries ago.

[The/A] large number of scientific artifacts in Korean history [had/have] proven that Koreans have been gifted in science.

Let's explore the wisdom of our ancestors by learning about some major Korean scientific heritage.

## Seokbinggo, a Freezer Made of Rocks

[Inventing/Invented] in the period of the Three Kingdoms, the seokbinggo was used as a "natural" refrigerator by our ancestors [by/until] the invention of the modern refrigerator.

When you go inside the seokbinggo [on/in/at] a warm day, you'll feel a [significant/significantly] temperature drop.

The seokbinggo was a [remarkable/remarkably] technological invention [that : \_\_\_\_\_] had several clever devices to screen [it/itself] from the heat.

First, the underground structure of the seokbinggo helped [keep/keeping] a low temperature inside.

Further, its floor, walls, and ceiling were made of granite, [that/which] cooled off the heat [good/well].

The most notable feature of the seokbinggo was the ceiling.

The seokbinggo was designed to make warm air [to gather/gather] into its hollow part and leave the storage through the ceiling which had ventilating holes with tiny roofs to keep the rain from entering inside.

One of [most/the most] useful [purpose/purposes] of the seokbinggo was [to store : 용법 \_\_\_\_\_] ice.

When a nearby river froze in the winter, ice was collected and stored in [it : \_\_\_\_\_].

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해석도 적어보세요.

The ice was used to keep food offerings [fresh/freshly] for important ceremonial services.

Sometimes, the ice was also shared [with/to] the sick and elderly, as well as high-ranking officials.

### Angbuilgu, a Unique Clock From the Joseon Dynasty

The angbuilgu was a movable sundial [that : \_\_\_\_\_] people [used to/used] accurately tell time [while/during] the Joseon Dynasty.

It was developed by three scientists- Jang Yeongsil, Lee Cheon, and Kim Jo- in the 16th year of King Sejong's reign (1434).

A small stick at the center of the angbuilgu [was created/created] a shadow [which : \_\_\_\_\_] moved as the sun rose and set.

The shadow [was pointed/pointed] to a certain time [marking/marked] on the angbuilgu which showed the time of day.

The angbuilgu also showed 24 periods of the solar calendar year by measuring the length of a shadow [changing/changed] across seasons.

King Sejong's love for his people was reflected in this invention.

He portrayed the pictures of 12 animals on the angbuilgu which greatly helped his illiterate people [to check/check/checking] the corresponding time of a day.

The 12 pictures indicated by the shadow easily showed them [what/that] part of a day they were in.

For use by common people, King Sejong kindly put the sundial in front of Jongmyo and on the Hyejeong Bridge in the downtown area of Jongno, as well as [the royal/in the royal] court.

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### The geobukseon, the World's First Ironclad Warship

The geobukseon is the first ironclad warship in the world.

Under the direction of Admiral Yi Sunsin, the geobukseon proved an important instrument for winning battles at sea, [showed/showing] great power and mobility.

What makes this ship [so/such] an excellent scientific achievement?

It was specially designed so sailors could see their enemies outside while they [were remained/remained] invisible.

[Like/Unlike] other warships, the geobukseon had its gunports [station/stationed] not only along its sides, but also at the head and tail of the ship.

This allowed sailors [fire/to fire] cannons from all sides of the ship with great [accurate/accuracy] and flexibility of range.

Moreover, [while/during] battles, the spikes on the roof were [hiding/hidden] with straw mats so [unsuspecting/unsuspected] enemies would get [hurts/hurt] if they tried to board the ship.

The geobukseon still [is remained/remains] a wonder [between/among] warship building specialists.

### Jikjisimcheyojeol, a Revolution in Publishing

The first movable metal type print in the world [invented/was invented] during the Goryeo Dynasty.

This invention made it [possible/possibly] [printing/to print] a great volume of books quickly.

Before it was invented, wooden block printing was the common method to publish books, but it could only print [limiting/limited] books in limited runs.

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Jikji, a collection of Buddhist teachings, [are/is] the oldest book [printed/printing] by the movable metal type.

It was published in 1377 in Heungdeok temple, 78 years [before/ago] the famous 42-line Bible was published by Gutenberg in Europe.

UNESCO confirmed [what/that] Jikji was the oldest book printed with the use of movable metal type. [in/On] September 4th, 2001, Jikji was registered in the "Memory of the World Prize" by this organization.

## Chapter 6. Notable Scientific Artifacts in Korean History

Today, Korea is \_\_\_\_\_ its sophisticated technology and advancements in science.  
 오늘날, 한국은 정교한 기술과 과학의 진보로 유명하다.

\_\_\_\_ a \_\_\_\_\_ of \_\_\_\_\_, Koreans \_\_\_\_\_ scientific excellence many centuries ago.  
 사실, 한국인들은 수 세기 전에 과학적 우수성을 성취하였다.

\_\_\_\_ large number of scientific artifacts in Korean history have proven that Koreans \_\_\_\_\_ gifted in science.

한국 역사 속의 많은 과학적인 유물들이 한국인이 과학에 재능이 있었다는 것을 증명해 왔다.

Let's explore the wisdom of our ancestors \_\_\_\_\_ about some major Korean scientific heritage.  
 한국의 주요한 과학적 유산에 대해 알아봄으로써 우리 조상들의 지혜를 탐구해 보자.

### Seokbinggo, a Freezer Made of Rocks

#### 석빙고, 돌로 만들어진 냉동실

\_\_\_\_\_ in the period of the Three Kingdoms, the seokbinggo \_\_\_\_\_ a "natural" refrigerator by our ancestors \_\_\_\_\_ the invention of the modern refrigerator.

삼국시대에 발명된 것으로, 석빙고는 현대의 냉장고가 발명될 때까지 우리 조상들에 의해 '자연적인' 냉장고로 사용되었다.

\_\_\_\_\_ you go \_\_\_\_\_ the seokbinggo on a warm day, you'll feel a significant temperature \_\_\_\_\_.  
 따뜻한 날에 석빙고 안에 들어가면, 현저한 기온 하락을 느낄 것이다.

The seokbinggo was a remarkable technological invention \_\_\_\_\_ had several clever devices to screen itself from the heat.

석빙고는 열을 차단하기 위한 몇 가지 기발한 장치를 가지고 있는 주목할 만한 과학 기술 발명품이다.

First, the underground structure of the seokbinggo helped \_\_\_\_\_ a low temperature inside.  
 우선, 석빙고의 지하 구조는 내부를 낮은 온도로 유지하는 데 도움을 주었다.

Further, its floor, walls, and ceiling were \_\_\_\_\_ granite, \_\_\_\_\_ cooled off the heat \_\_\_\_\_.  
 게다가, 바닥, 벽, 천장은 화강암으로 만들어졌는데, 이것이 열을 잘 식혀 주었다.

The most \_\_\_\_\_ feature of the seokbinggo \_\_\_\_\_ the ceiling.  
 석빙고의 가장 주목할 만한 특징은 천장이었다.

The seokbinggo was designed \_\_\_\_\_ air gather into its hollow part and leave the storage \_\_\_\_\_ the ceiling \_\_\_\_\_ had ventilating holes with tiny roofs \_\_\_\_\_ the rain from entering inside.

석빙고는 비어 있는 부분에 따뜻한 공기를 모아 천장을 통해 저장고를 빠져나가도록 설계되었는데, 천장에는 비가 내부로 들어오는 것을 막아주는 작은 지붕에 환기 구멍들이 있었다.

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\_\_\_\_\_ of the most useful \_\_\_\_\_ of the seokbinggo \_\_\_\_\_ to store ice.  
 석빙고의 가장 실용적인 목적 중 하나는 얼음을 저장하는 것이었다.

When a nearby river froze in the winter, ice was collected and stored \_\_\_\_ \_\_\_\_.  
 겨울에 가까이에 있는 강이 얼면, 얼음이 모아져서 석빙고 속에 저장되었다.

The ice was \_\_\_\_\_ to \_\_\_\_\_ food offerings fresh for important ceremonial services.  
 얼음은 중요한 의식을 위한 음식 제물을 신선하게 유지하기 위해 사용되었다.

Sometimes, the ice was also \_\_\_\_\_ the sick and elderly, \_\_\_\_\_ high-ranking officials.  
 때때로, 그 얼음은 고위관리들뿐만 아니라 환자와 노인들에게도 나눠졌다.

### Angbuilgu, a Unique Clock From the Joseon Dynasty

#### 양부일구, 조선시대의 독특한 시계

The angbuilgu was a movable sundial \_\_\_\_\_ people used to accurately tell time \_\_\_\_\_ the Joseon Dynasty.

양부일구는 조선시대 사람들이 정확하게 시간을 알기 위해 사용한 이동식 해시계였다.

It \_\_\_\_\_ three scientists - Jang Yeongsil, Lee Cheon, and Kim Jo - in the 16th year of King Sejong's reign (1434)

그것은 세종 16년(1434년)에 장영실, 이천, 김조 세 과학자에 의해 개발되었다.

A small stick \_\_\_\_\_ the center of the angbuilgu \_\_\_\_\_ a shadow \_\_\_\_\_ moved \_\_\_\_\_ the sun rose and set.

양부일구 중심에 있는 작은 막대는 해가 뜨고 짐에 따라서 움직이는 그림자를 만들었다.

The shadow pointed to a certain time \_\_\_\_\_ the angbuilgu \_\_\_\_\_ showed the time of day.  
 그 그림자는 양부일구에 표시된 특정 시간을 가리켜 하루의 시간을 알려주었다.

The angbuilgu also showed 24 periods of the solar calendar year \_\_\_\_\_ the length of a shadow \_\_\_\_\_ across seasons.

양부일구는 또한 계절에 따라 달라지는 그림자의 길이를 측정하여 양력의 24절기를 알려주기도 했다.

King Sejong's love \_\_\_\_\_ his people was \_\_\_\_\_ in this invention.

세종대왕의 백성에 대한 사랑이 이 발명품에 반영되었다.

He portrayed the pictures of 12 animals on the angbuilgu \_\_\_\_\_ greatly \_\_\_\_\_ his \_\_\_\_\_ people check the corresponding time of a day.

그는 문맹인 백성들이 하루 중 해당 시간을 확인하는 데 큰 도움이 되는 12가지 동물의 그림을 양부일구에 그려 넣었다.

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The 12 pictures \_\_\_\_\_ the shadow easily showed them \_\_\_\_\_ part of a day they \_\_\_\_\_.  
 그림자가 가리키는 12가지 그림은 그들이 하루 중 어느 시간에 있는지를 쉽게 보여주었다.

\_\_\_\_\_ use by common people, King Sejong kindly \_\_\_\_\_ the sundial \_\_\_\_\_ Jongmyo and on the Hyejeong Bridge in the downtown area of Jongno, \_\_\_\_\_ in the royal court.  
 일반 백성들이 사용할 수 있도록 세종대왕은 친절하게도 이 해시계를 궁중뿐만 아니라, 종묘 앞과 종로 시내에 있는 혜정교에도 두었다.

### Geobukseon, the World's First Ironclad Warship

#### 거북선, 세계 최초의 철갑선

The geobukseon is the first ironclad warship in the world.

거북선은 세계 최초의 철갑선이다.

\_\_\_\_\_ the direction of Admiral Yi Sunsin, the geobukseon \_\_\_\_\_ an important instrument for winning battles at sea, \_\_\_\_\_ great power and mobility.

이순신 장군의 지시 아래, 거북선은 강력한 힘과 기동성을 보이며 해전에서의 승리를 위한 중요한 수단임을 입증하였다.

\_\_\_\_\_ this ship such an excellent scientific achievement?

무엇이 이 배를 이렇게 우수한 과학적 업적으로 만들었을까?

It was specially designed \_\_\_\_\_ sailors could see their enemies outside \_\_\_\_\_ they \_\_\_\_\_.

거북선은 특별히 설계되어서 선원 자신들은 보이지 않게 유지하는 반면, 밖에 있는 적들을 볼 수 있었다.

\_\_\_\_\_ other warships, the geobukseon had its gunports \_\_\_\_\_ along its sides, \_\_\_\_\_ at the head and tail of the ship.

다른 군함과는 다르게, 거북선은 배의 측면뿐만 아니라 뱃머리와 후미에도 포문을 배치했다.

This \_\_\_\_\_ sailors \_\_\_\_\_ cannons from all sides of the ship \_\_\_\_\_ great \_\_\_\_\_ and flexibility of range.

이는 선원들이 높은 정확도와 사정거리의 유연성을 가지고 배의 모든 면에서 대포를 발사할 수 있게 하였다.

\_\_\_\_\_, during battles, the spikes on the roof \_\_\_\_\_ hidden \_\_\_\_\_ straw mats so unsuspecting enemies would \_\_\_\_\_ if they tried to board the ship.

게다가, 전시에 지붕에 있는 뾰족한 못들이 멍석으로 감추어져 있어서, 이상한 낚새를 채지 못한 적들이 배에 오르려고 하면 다칠 것이다.

The geobukseon still \_\_\_\_\_ a wonder \_\_\_\_\_ warship building specialists.

거북선은 아직도 군함 축조 전문가들 사이에서 경이로움으로 남아 있다.

## Chapter 6. Notable Scientific Artifacts in Korean History

### Jikjisimcheyo jeol, a Revolution in Publishing

#### 직지심체요절, 인쇄술의 혁명

The first movable metal type print in the world was \_\_\_\_\_ the Goryeo Dynasty.  
세계 최초의 이동식 금속 활자는 고려시대에 발명되었다.

This invention \_\_\_\_\_ print a great volume of books quickly.  
이 발명은 많은 양의 책을 빠른 시간 안에 인쇄하는 것을 가능케 했다.

\_\_\_\_\_ it was invented, wooden block printing was the common method to publish books, but it could only print limited books in limited runs.

그것이 발명되기 전에는, 목판 인쇄가 책을 인쇄하는 일반적인 방법이었지만, 제한된 횟수로 제한된 책만을 인쇄할 수 있었다.

Jikji, a collection of Buddhist teachings, \_\_\_ the oldest book \_\_\_\_\_ the movable metal type.  
불교 가르침의 모음집인 직지는 이동식 금속 활자로 인쇄된 가장 오래된 책이다.

It was published in 1377 in Heungdeok temple, 78 years \_\_\_\_\_ the famous 42-line Bible was \_\_\_\_\_ by Gutenberg in Europe.

그것은 유럽에서 구텐베르크가 유명한 42행 성서를 출간하기 78년 전인 1377년에 흥덕사에서 출간되었다.

UNESCO confirmed \_\_\_\_\_ Jikji was the oldest book \_\_\_\_\_ the use of movable metal type.  
UNESCO는 직지가 이동식 금속 활자를 이용해 인쇄된 가장 오래된 책임을 공식화하였다.

On September 4th, 2001, Jikji was \_\_\_\_\_ in the "Memory of the World Prize" by this organization.  
2001년 9월 4일, 직지는 UNESCO에 의해 '세계기록 문화유산'에 등재되었다.

Chapter 6. Notable Scientific Artifacts in Korean History

📖 주어진 단어를 활용하여 박스 안의 문장을 영작하세요. (단어 형태 변경 가능)

1. today / known for / sophisticated technology / advancements / science

오늘날, 한국은 정교한 기술과 과학의 진보로 유명하다.

= \_\_\_\_\_

2. a large number / scientific artifacts / Korean history / prove / have / gifted / science

한국 역사 속의 많은 과학적인 유물들이 한국인이 과학에 재능이 있었다는 것을 증명해 왔다.

= \_\_\_\_\_

3. invent / the period / the Three Kingdoms / the seokbinggo / used / a "natural" refrigerator / our ancestors / the invention / the modern refrigerator

삼국시대에 발명된 것으로, 석빙고는 현대의 냉장고가 발명될 때까지 우리 조상들에 의해 '자연적인' 냉장고로 사용되었다.

= \_\_\_\_\_

4. further / floor / walls / ceiling / made / granite / which / cool / the heat / well

계다가, 바닥, 벽, 천장은 화강암으로 만들어졌는데, 이것이 열을 잘 식혀 주었다.

= \_\_\_\_\_

5. The seokbinggo / designed / make / warm / gather / its hollow part / leave / through / the ceiling ventilating holes / tiny roofs / keep / from / enter / inside

석빙고는 비어 있는 부분에 따뜻한 공기를 모아 천장을 통해 저장고를 빠져나가도록 설계되었는데, 천장에는 비가 내부로 들어오는 것을 막아주는 작은 지붕에 환기 구멍들이 있었다.

= \_\_\_\_\_

6. the angbuilgu / a movable sundial / people / use / accurately / tell / during / the Joseon Dynasty

양부일구는 조선시대 사람들이 정확하게 시간을 알기 위해 사용한 이동식 해시계였다.

= \_\_\_\_\_

Chapter 6. Notable Scientific Artifacts in Korean History

☞ 주어진 단어를 활용하여 박스 안의 문장을 영작하세요. (단어 형태 변경 가능)

7. a small stick / the center / the angbuilgu / a shadow / moved / the sun / rise / set

양부일구 중심에 있는 작은 막대는 해가 뜨고 짐에 따라서 움직이는 그림자를 만들었다.

= \_\_\_\_\_

8. what / the ship / excellent / scientific achievement

무엇이 이 배를 이렇게 우수한 과학적 업적으로 만들었을까?

= \_\_\_\_\_

9. it / designed / so / sailors / see / their enemies / while / they / invisible

거북선은 특별히 설계되어서 선원 자신들은 보이지 않게 유지하는 반면, 밖에 있는 적들을 볼 수 있었다.

= \_\_\_\_\_

10. other warships / the geobukseon / had / gunports / station / not only / its sides / but also the head / tail of the ship

다른 군함과는 다르게, 거북선은 배의 측면뿐만 아니라 뱃머리와 후미에도 포문을 배치했다.

= \_\_\_\_\_

11. this invention / made / possible / print / a great volume / books / quickly

이 발명은 많은 양의 책을 빠른 시간 안에 인쇄하는 것을 가능케 했다.

= \_\_\_\_\_

12. it / colder / we / went / higher / the mountain

산 위로 올라갈수록 더 추워졌다.

= \_\_\_\_\_

13. it / a New Year' s holiday / the bank / closed

설 연휴였기 때문에 모든 은행이 문을 닫았다.

= \_\_\_\_\_

Chapter 6. Notable Scientific Artifacts in Korean History

☞ 각각의 질문에 한글 답변을 주어진 단어를 활용하여 영작하세요.

14. Why is the ceiling of the *seokbinggo* particularly notable?

The seokbinggo / designed / make / warm / gather / its hollow part / leave / through / the ceiling ventilating holes / tiny roofs / keep / from / enter / inside

석빙고는 비어 있는 부분에 따뜻한 공기를 모아 천장을 통해 저장고를 빠져나가도록 설계되었는데 천장에는 비가 내부로 들어오는 것을 막아주는 작은 환기 구멍들이 있었다.

=

15. Why was the ice stored in the *seokbinggo*?

it / used / keep / food offerings / important ceremonial services / sometimes / the ice / shared / the sick / elderly / as / high-ranking officials

이것은 중요한 의식을 위한 음식 제물을 신선하게 유지하기 위해 사용되었다. 때때로, 그 얼음은 고위관리들뿐만 아니라 환자와 노인들에게도 나눠졌다.

=

16. How did the *angbuilgu* show 24 periods of the solar calendar year?

it / them / measuring / the length / a shadow / change / across

계절에 따라 달라지는 그림자의 길이를 측정함으로써 나타냈다.

=

17. What did King Sejong do for his illiterate people?

he / the pictures / 12 animals / the angbuilgu / greatly / helped / his illiterate people / the corresponding time / a day

그는 문맹인 백성들이 하루 중 해당 시간을 확인하는 데 큰 도움이 되는 12가지 동물의 그림을 양부일구에 그려 넣었다.

=

Chapter 6. Notable Scientific Artifacts in Korean History

🐞 각각의 질문에 한글 답변을 주어진 단어를 활용하여 영작하세요.

18. Why were the spikes on the roof of the *geobukseon* hidden with the straw mats?

they / hidden / straw mats / unsuspecting enemies / hurt / they / try / board / the ship

지붕에 있는 보죽한 못들이 멍석으로 감추어져 있어서, 이상한 짐새를 채지 못한 적들이 배에 오르려고 하면 다칠 것이다.

=

19. What is the major difference between movable metal type print and wooden block printing?

this invention / made / possible / print / a great volume / books / quickly / wooden block printing  
the common method / publish books / but / could / print / limited books / limited runs

이 발명은 많은 양의 책을 빠른 시간 안에 인쇄하는 것을 가능케 했다. 목판 인쇄가 책을 인쇄하는 일반적인 방법이었지만, 제한된 횟수로 제한된 책만을 인쇄할 수 있었다.

=

## Chapter 6. Notable Scientific Artifacts in Korean History

### ANSWER

1. Today, Korea is known for its sophisticated technology and advancements in science.
2. A large number of scientific artifacts in Korean history have proven that Koreans have been gifted in science.
3. Invented in the period of the Three Kingdoms, the seekbinggo was used as a "natural" refrigerator by our ancestors until the invention of the modern refrigerator.
4. Further, its floor, walls, and ceiling were made of granite, which cooled off the heat well.  
  
The seekbinggo was designed to make warm air gather into its hollow part and leave the storage
5. through the ceiling which had ventilating holes with tiny roofs to keep the rain from entering inside.
6. The angbuilgu was a movable sundial that people used to accurately tell time during the Joseon Dynasty.
7. A small stick at the center of the angbuilgu created a shadow which moved as the sun rose and set.
8. What makes this ship such an excellent scientific achievement?
9. It was specially designed so sailors could see their enemies outside while they remained invisible.
10. Unlike other warships, the geobukseon had its gunports stationed not only along its sides, but also at the head and tail of the ship.
11. This invention made it possible to print a great volume of books quickly.
12. It became colder as we went up higher on the mountain.
13. As it was a New Year' s holiday, all the banks were closed.  
  
The seekbinggo was designed to make warm air gather into its hollow part and leave the storage
14. through the ceiling which had ventilating holes with tiny roofs to keep the rain from entering inside.

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## Chapter 6. Notable Scientific Artifacts in Korean History

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### ANSWER

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15. It was used to keep food offerings fresh for important ceremonial services. Sometimes, the ice was also shared with the sick and elderly, as well as high-ranking officials.
16. It showed them by measuring the length of a shadow changing across.
17. He portrayed the pictures of 12 animals on the angbuilgu which greatly helped his illiterate people check the corresponding time of a day.
18. They were hidden with straw mats, so unsuspecting enemies would get hurt if they tried to board the ship.
19. This invention made it possible to print a great volume of books quickly. Wooden block printing was the common method to publish books, but it could only print limited books in limited runs.

# CHAPTER TEST

Chapter 6. Notable Scientific Artifacts in Korean History

1 다음 중 자연스럽게 않은 대화를 고르시오.

- ① A: Can I ask you to help organize the party?  
B: Sure. I'll be glad to do that.
- ② A: Did you find the book interesting?  
B: To be honest, it was a bit boring.
- ③ A: I went to the *Hangari* Festival last Sunday.  
B: Sounds like fun! Did you find it interesting?
- ④ A: Can I ask you to come to the Korean Folk Village with me tomorrow?  
B: Of course, you can go there.
- ⑤ A: Are you interested in Korean food?  
B: Yes. I'd like to try many different dishes.

2 다음 빈칸에 공통으로 들어갈 말을 쓰시오.

- He is working \_\_\_\_\_ a travel agent.
- The rules apply to teachers \_\_\_\_\_ well as students.
- \_\_\_\_\_ it was Sunday, all the drugstores were closed.

3 자연스러운 대화가 되도록, 문장들을 순서대로 배열한 것을 고르시오.

A: Ms. Ryder, I hope you are having a great time in Korea.  
B: Thank you so much for being my tour guide, Mr. Han.  
A: My pleasure. I have a special gift for you. It's a *norigae*.

- (A) It's beautiful. Please show me how to put it on.
- (B) Thanks! Could you tell me what this is for?
- (C) It is a decoration for a women's *hanbok*.

- ① (A) - (C) - (B)      ② (B) - (A) - (C)
- ③ (B) - (C) - (A)      ④ (C) - (A) - (B)
- ⑤ (C) - (B) - (A)

4 다음 빈칸에 들어갈 말이 다른 하나를 고르시오.

- ① I \_\_\_\_\_ my hair dyed yesterday.
- ② Have you \_\_\_\_\_ enough rest?
- ③ He \_\_\_\_\_ left home before I arrived.
- ④ She \_\_\_\_\_ her daughter wash her car last weekend.
- ⑤ She decided to \_\_\_\_\_ her bag changed to a different color.

5 다음과 같은 의미를 나타내는 단어를 글에서 찾아 쓰시오.

large enough to be important or affect a situation to a noticeable degree

Invented in the period of the Three Kingdoms, the *seokbinggo* was used as a "natural" refrigerator by our ancestors until the invention of the modern refrigerator. When you go inside the *seokbinggo* on a warm day, you'll feel a significant temperature drop.

6 다음 글의 제목으로 가장 알맞은 것을 고르시오.

The *seokbinggo* was a remarkable technological invention that had several clever devices to screen itself from the heat. First, the underground structure of the *seokbinggo* helped keep a low temperature inside. Further, its floor, walls, and ceiling were made of granite, which cooled off the heat well. The most notable feature of the *seokbinggo* was the ceiling. The *seokbinggo* was designed to make warm air gather into its hollow part and leave the storage through the ceiling which had ventilating holes with tiny roofs to keep the rain from entering inside.

- ① What Is the *Seokbinggo* for?
- ② The History of the *Seokbinggo*
- ③ How the *Seokbinggo* Changed Lifestyle
- ④ The Hidden Story about the *Seokbinggo*
- ⑤ What Makes the *Seokbinggo* Keep Cool?

Chapter 6. Notable Scientific Artifacts in Korean History

7 다음 중 앙부일구에 대한 설명 중, 일치하는 것을 고르시오.

The *angbuilgu* was a movable sundial that people used to accurately tell time during the Joseon Dynasty. It was developed by three scientists – Jang Yeongsil, Lee Cheon, and Kim Jo – in the 16th year of King Sejong’s reign (1434). A small stick at the center of the *angbuilgu* created a shadow which moved as the sun rose and set. The shadow pointed to a certain time marking on the *angbuilgu* which showed the time of day. The *angbuilgu* also showed 24 periods of the solar calendar year by measuring the length of a shadow changing across seasons.

- ① 고정된 형태의 해시계이다.
- ② 세종대왕에 의해 개발되었다.
- ③ 가운데에 움직이는 막대가 있다.
- ④ 그림자를 통해 날씨를 추측할 수 있다.
- ⑤ 그림자의 길이로 절기를 구분할 수 있다.

8 다음 문장이 들어가기에 가장 적절한 곳을 고르시오.

Then the ice was put in deep holes called *Yakhchal*.

( ① ) By 400 BC, Persian people mastered skills for storing ice during hot summers. ( ② ) Large amounts of ice were carried during the winter months from nearby mountains to many cities built in the desert. ( ③ ) These ancient refrigerators were used primarily for storing ice and food in the hot, dry desert weather of Persia. ( ④ ) The ice was used to make a traditional Persian frozen dessert, called *faloodeh*, which was served to the king and his family on the hottest days of summer. ( ⑤ )

9 다음 글의 내용을 한 문장으로 요약하고자 할 때, 빈 칸 (A)와 (B)에 들어갈 말이 알맞게 짝지어진 것을 고르시오.

The *geobukseon* was specially designed so sailors could see their enemies outside while they remained invisible. Unlike other warships, the *geobukseon* had its gunports stationed not only along its sides, but also at the head and tail of the ship. This allowed sailors to fire cannons from all sides of the ship with great accuracy and flexibility of range.

The *geobukseon* was designed not to be \_\_\_\_\_ (A) \_\_\_\_\_ by the enemies and had its gunports stationed along every side of the ship so sailors could \_\_\_\_\_ (B) \_\_\_\_\_ fire cannons.

- ① seen ---- easily
- ② seen ---- quickly
- ③ seen ---- accurately
- ④ sunk ---- quickly
- ⑤ sunk ---- accurately

10 다음 글의 밑줄 친 The first movable metal type print가 가져온 가장 큰 변화는 무엇인지 우리말로 쓰시오.

The first movable metal type print in the world was invented during the Goryeo Dynasty. This invention made it possible to print a great volume of books quickly. Before it was invented, wooden block printing was the common method to publish books, but it could only print limited books in limited runs.

## Chapter 6. Notable Scientific Artifacts in Korean History

## ANSWER

1. ④ 2. as 3. ③ 4. ⑤ 5. significant 6. ⑤ 7. ⑤ 8. ③  
9. ③ 10. 짧은 시간 안에 많은 양의 책을 인쇄할 수 있게 되었다.

1. 민속촌에 같이 가줄 수 있는 요청의 표현에 '물론 당신은 갈 수 있어요.' 라는 응답은 자연스럽지 않다.
2. 첫 번째는 '~로서' 라는 자격을 나타내는 전치사 as로 쓰였고, 두 번째는 as well as로 쓰여 '~뿐만 아니라' 는 뜻을 나타낸다. 세 번째는 이유나 원인을 나타내는 접속사 as로 쓰였다.
3. 외국인이 노리개를 선물 받은 상황이므로 먼저 감사의 인사를 하고 무엇에 쓰는 것인지 물어보고 설명하는 흐름이 자연스럽다.
4. ①, ④는 사역동사로 쓰인 had로 '~하게 시키다, 만들다' 라는 의미로 사용되었다. ②는 현재완료를 만들기 위한 had, ③은 도착한(arrived) 것보다 이전에 일어난 일로 과거완료를 만들기 위한 had가 들어가야 한다. ⑤는 decide의 목적어로 to부정사가 와야 하므로 빈칸에 have가 와야 한다.
5. '영향을 끼칠 정도로 중요하거나 두드러진 것' 을 나타내는 어휘는 significant(중요한, 의미있는)이다.
6. 낮은 온도를 유지할 수 있었던 석빙고의 구조에 대해 설명하는 단락이다.
7. 양부일구는 움직이는 해시계로, 세종 때 장영실, 이천 등에 의해 만들어졌다. 가운데 고정된 막대가 시간에 따라 다른 길이의 그림자를 만든다. 그 길이를 보고 시간과 절기를 구분하였다.
8. 주어진 문장이 '그 다음에, 그 얼음은 Yakhachal이라고 불리는 깊은 구멍에 넣어졌다' 라는 내용이므로, 많은 양의 얼음이 운반되었다는 내용 다음에 이어지는 것이 자연스럽다.
9. 거북선은 적들이 밖에 있을 때 보이지 않게(not to be seen) 하고, 배의 앞, 뒤, 측면 등 여러 곳에서 대포를 쏠 수 있었기 때문에 정확하게 (accurately) 적을 겨냥할 수 있었다.
10. 이전에는 제한된 양의 책만을 인쇄할 수 있었으나, 이동식 금속 활자가 발명된 후 많은 양의 책을 빨리 인쇄할 수 있게 되었다고 나와 있다.

## Chapter 6. Notable Scientific Artifacts in Korean History

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### An Ancient Way to Store Ice in the Desert

By 400 BC, Persian people mastered skills for storing ice during hot summers.

Large amounts of ice were carried during the winter months from nearby mountains to many cities built in the desert.

Then the ice was put in deep holes called *Yakhchal*.

These ancient refrigerators were used primarily for storing ice and food in the hot, dry desert weather of Persia.

The ice was used to make a traditional Persian frozen dessert, called *faloodeh*, which was served to the king and his family on the hottest days of summer.

Above ground, the dome-shaped structure is made up of large, mud bricks piled upon each other, rising as high as 60 feet, which covered underground spaces as large as 5,000m<sup>2</sup>.

The inside of the dome had a *Qanat* that pushed the hot air out and pulled the very cold air down around the ice and food.

This system easily managed to keep temperatures inside the *Yakhchal* near freezing even when desert temperatures were well above 30° C.

## Chapter 6. Notable Scientific Artifacts in Korean History

해석도 적어보세요.

## An Ancient Way to Store Ice in the Desert

[Until/By] 400 BC, Persian people [has mastered/mastered] skills for storing ice [for/during] hot summers.

Large amounts of ice [was/were] carried [for/during] the winter months from [nearby/nearly] mountains to many cities [building/built] in the desert.

Then the ice [put/was put] in deep holes [are called/called] *Yakhchal*.

These ancient refrigerators were used [primary/primarily] for storing ice and food in the hot, dry desert weather of Persia.

The ice was used [to make/to making] a traditional Persian frozen dessert, called *faloodeh*, which was served [to/for] the king and his family [at/on] the hottest days of summer.

[Under/Above] ground, the dome-shaped structure is [made up/made up of] large, mud bricks piled upon each other, [raising/rising] as high as 60 feet, [which/that] covered underground spaces as large as 5,000m<sup>2</sup>.

The inside of the dome had a *Qanat* that [was pushed/pushed] the hot air out and pulled the very cold air down around the ice and food.

This system easily [is managed/managed] to keep temperatures inside the *Yakhchal* near freezing even when desert temperatures were well above 30° C.

Q. What is the main topic of the passage?

- a) the mystery about an ancient Persian dome
- b) a popular icy dessert for ancient Persian people
- c) the leisure life of Persian people in the hot desert
- d) the hardship the Persians had while building a Yakhchal
- e) how the ancient Persian refrigerator worked and was used