

Lesson 3

1
차
시

Sports and Science Get Along

단원 설정 취지

일상 운동의 효과와 다양한 스포츠에 대해 알아보고, 특히 육상, 컬링, 그리고 야구에 작용하는 과학 원리를 이해하는 기회를 갖는다.

단원 지도 계획

차시	학습 단계	학습 활동
1	단원 시작	동영상 시청 / 학습 목표 및 내용 미리 보기
	Listen and Speak 1	다양한 운동의 효과 알리기 - (진술하기) "There are..." ▶ 수업 자료: Dictation Worksheet
2	Listen and Speak 2	스포츠에 관한 흥미로운 사실 소개하기 - (확인 요청하기) "Do you mean...?" ▶ 수업 자료: Dictation Worksheet
	In Real Life	루지 경기 중계방송을 들은 후, 수영 경기 중계방송하기 ▶ 수업 자료: Dictation Worksheet Speaking Worksheet (수행평가)
3~6	Before You Read	스포츠에 관한 간단한 퀴즈 풀기 / 본문 어휘 미리 보기 ▶ 수업 자료: Vocabulary Worksheet
	Reading	육상, 컬링, 야구에 작용하는 과학 원리에 관한 글 읽기 ▶ 수업 자료: Further Questions for Reading
	After You Read	본문 이해 점검하기
7	Language Focus	본문에 나온 어휘, 표현, 문법 익히기 ▶ 수업 자료: Vocabulary Test Grammar Worksheet
8	Writer's Workshop	교내 스포츠 동아리 회원 모집을 위한 홍보물 완성하기
9	Wrap-up Test	단원 마무리 테스트
10	Project	스포츠와 관련된 직업을 조사하여 발표하기
	Read More!	추가 읽기: Technology Doping (p.148)

동영상 소개 수영과 역도 선수들이 과학적인 훈련법을 통해 기록과 기량의 향상을 이루는 것을 보여주는 영상이다. 현대 스포츠 발전에 있어 많은 역할을 하는 스포츠 과학의 중요성을 생각해 본다.

Teaching Tips 영상 시청 후 warm-up 활동으로 간단한 질문을 통해 이해도를 점검한다.

- Which equipment or training method do you find most interesting?
(I find Jang Miran's weightlifting footwear most interesting. I'm impressed that it can help balance her legs.)
- How important do you think sports science is in modern sports?
(I think sports science plays an important role in the development of sports. However, it is the people who make differences, not the devices or the science itself.)

Self-check

Check if you know the expressions below.

진술하기

- ☐ Many bike rental shops **are** along the river.

확인 요청하기

- ☐ **Did you say** figure skaters can use music with lyrics?

Compare the structural differences between the sentences on the right and those below.

- They can take **more** steps **than** we do.
- This is the reason **why** they have to do it.

Before You Begin

Watch how science-based training can bring out better performance in athletes. Then talk about what you find most interesting.



Link 스마트 교수자료

Lesson Overview

Theme 운동과 건강 / 스포츠와 과학

- L & S** 일상 운동의 효과와 다양한 스포츠에 대해 듣고 말한다.
- R** 육상, 컬링, 야구에 작용하는 과학 원리에 대해 읽는다.
- W** 교내 스포츠 동아리 회원 모집을 위한 홍보물을 완성한다.

Listening & Speaking

- 진술하기 **There are** many bicycle rental shops along the river.
- 확인 요청하기 **Do you mean** figure skaters can skate to music with lyrics?

Language Structures

- Adult cheetahs can take **twice as** many steps **as** we do. ▶ 원급을 이용한 배수 표현
- This is **why** players have to direct the stone's path carefully. ▶ 관계부사

Plan Ahead Skim the pages that follow and write about what you expect to learn in this lesson.

- I will learn about fun facts about various sports.
- The title of the part that looks most interesting is "Broadcast a Sporting Event".

Listen and Speak 1

Everyday Exercise and Health

진술하기 **There are** many bicycle rental shops along the river.

~이 있다

• 유사 표현

주어 is(are)... / There exist(s)...

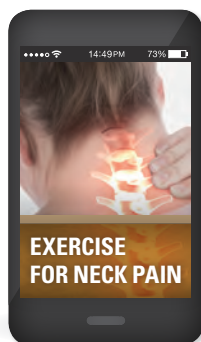
A Listen

1 What is the purpose of the girl's phone call?

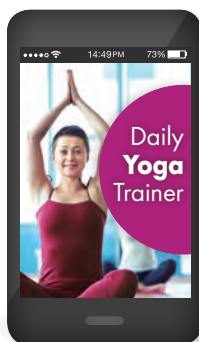
- ✓ a to ask her friend to ride a bike together
- b to recommend a good bicycle shop to her friend
- c to get information about the health benefits of cycling

2 Which app is the girl most likely to try after the dialog?

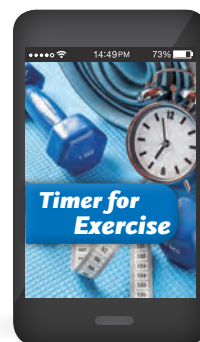
a



✓ b



c



Plus+ Dictation Worksheet (p.160 in Teacher's Material)

B Speak Out

Link 스마트 교수자료(익소 PPT)

Suppose you are at a fitness center. Practice the dialog with your partner.

A Excuse me. I'm interested in a class that will help me lose weight.

B **There's** a good **swimming** class available.

A Great. When is the class?

B On **Mondays** from 5 to 6 p.m.

Health Benefits	Class	Time
build muscles in arms and legs 근육을 키우다	indoor rock climbing	Tue. 7-8 p.m.
improve flexibility 유연성	yoga	Thur. 6-7 p.m.
improve balance	<u>bike riding</u> your own	<u>Fri. 5-6 p.m.</u> your own

Sample Talk further Talk about a kind of exercise you'd like to learn for your health.

A What exercise would be good for losing weight?

B **There's** a good boxing class available. It'll get you in shape.

Get Ready >

Check the exercise you usually do.

- ☐ running
- ☐ cycling
- ☐ skateboarding
- ☐ _____
(your own)

Sample

- I enjoy running because it keeps me healthy.
- I go bike riding about three times a week.

Transcripts for Listen and Speak 1

1 [Cell phone rings.]

M Hello, Minji. What's up?

W Hello, Jack. I called you to ask if you'd like to go out to Hangang and ride a bike with me this weekend.

M That would be great, but I don't have a bicycle.

W Don't worry. **There are** many bicycle rental shops along the river.

M Great! What about you? Do you have your own bike?

W Yep. I have my own. I often ride my bike with my friends. Cycling is great exercise.

M What's so great about it?

자전거 타는 것이 어떤 점이 그리 좋니?

W Cycling burns twice as many calories as walking.

M Really? Well, that might help me lose weight, then.

More & More 다이어트와 관련된 영어 표현

- 살이 빠지다 lose weight, shed weight (← 살이 찌다 gain weight, put on weight)
- 정크 푸드를 줄이다 cut down on junk food
- 나는 다이어트 중이다. I'm on a diet. / I'm dieting.

2 **W** What are you doing back there?

M My neck and shoulders are pretty stiff, so I'm stretching during the break.

W Looks like you know what you're doing! Do you take any lessons?

M Sort of. I have a yoga application on my phone.

W How does it work?

M It's simple. You just follow what the trainer says on the app. She explains everything. You can even choose the difficulty level, too.

W Really? That's great, but isn't it hard to do it regularly?

M Sometimes yes, but I can adjust the length of the lesson based on how much time I have. **There are** plenty of other options on the app as well.

W That's terrific! I'll give it a try. Thanks.

More & More 동사 give와 함께 쓰는 생활 표현

- give a hug 안아 주다
- give a ride(lift) 차로 태워 주다
- give a party 파티를 열다
- give a break 쉬게 하다

| More Sample for Talk Further |

- A** Can you recommend any exercise class for me?
B There's an aerobic class at the community center. It'll make you stronger and fitter.

Oral Quiz

- 1) Where will the man borrow a bicycle?

He will borrow a bicycle at a bicycle rental shop along the river.

- 2) Why does the woman think that riding a bike is a great workout?

It burns twice as many calories as walking.

Oral Quiz

- 1) What does the man use for his stretching exercise?

He uses a yoga application on his phone for his stretching exercise.

- 2) What are the examples of the options on the yoga app mentioned?

The difficulty level and the length of the lesson are the two options on the yoga app.

확인 요청하기 ~라는 말이니(뜻이니)?
Do you mean figure skaters can skate to music with lyrics?

• 유사 표현

Did you say... ? / Does that mean... ?

Get Ready >>

Choose what you think is true.

- a Olympic gold medals are made of pure gold.
✓ b An official soccer ball has 32 pieces of leather.

해설 Olympic gold medals are not made of pure gold but are made of about 92 percent silver.

A Listen

1 Why is music with lyrics allowed in figure skating now?

- a because it is easier for skaters to dance to
✓ b because it is expected to attract more fans
c because it helps skaters make more graceful movements

2 Which picture best illustrates the movement of the arrow?

✓ a



b



c



B Speak Out



Link 스마트 교수자료(익소 PPT)

Talk with your partner about the sports facts given below.

A It's interesting. They say "love" when a player has not scored in a tennis game.

B Do you mean "love" refers to zero points in tennis?

~을 나타낸다, 말하다

A Yes. There are many fun facts in sports.



- Tug of war was an Olympic event in the early 1900s.
- People played tug of war in the Olympics.



- Golf was the first sport played on the moon.
- An astronaut took a golf club to the moon.



- The oldest Olympic competitor was 72 years old.
- A 72-year-old man actually competed in the Olympics.

your own

Sample

Talk further

Talk about some interesting facts about sports that you know of.

A I heard that wrestling matches were nude in the ancient Greek Olympics.

B Do you mean wrestlers didn't wear any clothes? It's very funny!

Transcripts for Listen and Speak 2

1 M That figure skater is amazing! Her movements are so precise and graceful.
정확한

W She probably trained day and night.

M You're right. Is it true that music with lyrics is not allowed in international figure skating competitions?
밤낮으로
가수여 진주어절 가사

W Not any longer. They changed that rule.
더 이상은 안 그래.

M **Do you mean** figure skaters can now skate to music with lyrics?
가사가 있는 음악에 맞추어

W Right. The International Skating Union announced in 2014 that figure skaters can use pop songs in their programs.
국제빙상경기연맹 발표하다

M So they can dance to Michael Jackson's songs, too?

W Yes, they can.

M Aren't lyrics distracting to the judges?
산만하게 하는 심사위원 심판

W True, but the Union wants to attract more fans.

More & More 전치사 to

전치사 to는 '~에 맞게/일치하여, 따라서, 맞추어'의 뜻을 나타내는 경우들이 있다.

- march **to** a tune 곡에 맞추어 행진하다
- sing **to** the piano 피아노에 맞추어 노래하다
- be **to** one's taste ~의 취향에 맞다
- be true **to** the original 원작에 충실하다

2 W Hey, are you reading an archery magazine again?

M Yeah, I'm into archery these days.
양궁, 활쏘기

W What do you like about it?
~에 관심이 많다. ~을 좋아하다

M The Archer's Paradox, among others. I don't fully understand it, 궁사의 패러독스(화살이 좌우로 흔들리며 날아가는 현상) 그것을 완전히 이해하는 것은 아니다(부분부정) though.

W Archer's Paradox? **Do you mean** how arrows are aimed off target but end up on target?
조준하다, 겨냥하다 과녁을 벗어나

M Exactly. How does the arrow hit the target without traveling straight?
과녁을 명중하다 똑바로 이동하다

W I've heard it has to do with the flexibility of the arrow. The arrow moves like a snake from side to side after it's shot but ultimately reaches the target.
~와 관계가 있다 유연성, 탄력성 좌우로 (흔들리는) 결국, 궁극적으로

M Yeah. Archers need to understand a lot about physics as well as practice a lot in order to improve at their sport.
물리학 ~뿐만 아니라

W Cool. Well, if there's anything more about the Archer's Paradox in that magazine, let me know.

More & More target과 관련된 표현

- meet the **target** 목표를 달성하다
- set the **target** 목표를 정하다
- **target** market 표적 시장
- **target** a niche market 틈새시장을 공략하다

| More Sample for Talk Further |

- A Most broken Major League bats are used as building materials in poor countries.
B Do you mean they are sent to those countries for construction works? Hmm... That's interesting.

Oral Quiz

1) What was the rule like regarding the use of music in figure skating before 2014?

Music with lyrics was not allowed before 2014.

2) What does the man think of the pop songs used in figure skating?

He thinks that they are distracting to the judges.

Oral Quiz

1) What is the man interested in recently?

He is interested in archery recently.

2) What characteristic of the arrow enables it to move from side to side?

The flexibility of the arrow enables it to move from side to side.

Teaching Tips 스포츠 경기 진행자의 어투, 억양 등에 주목해서 듣게 한다.

A Listen

Listen and fill in the blanks.

A good start depends on a hard push and a fast acceleration with the spiked gloves.

힘껏 밀기
가속

Transcripts

- M** Viewers, welcome to the men's singles at the Luge World Cup from Calgary, Canada. Sitting on the sled at the start line is Felix Loch of Germany.
- W** Will Felix be able to set a new world record today? **There are** lots of rumors out there about that.
- M** We'll see shortly. Felix is now about to start.
- W** It's extremely important to make a good start in luge. How hard you push yourself onto the track and how fast you accelerate with the spiked gloves at the beginning make a big difference.
- M** Indeed. It looks like Felix is ready. He has made an explosive start out of the gate!
- W** And he's made a perfect first turn!
- M** Perfect, indeed!

GER FELIX LOCH

Indeed. He makes an explosive start out of the gate.

Words & Expressions

- men's singles 남자 개인전
- be about to 막 ~하려고 하다
- accelerate 속도를 높이다, 가속하다
- explosive 폭발적인, 굉음의
- set a world record 세계 기록을 세우다
- extremely 극도로, 매우
- spiked 스파이크(못, 징가 달린)
- make a perfect turn 회전을 완벽하게 하다

SPORT NEWS

Luge World Cup – Men's Singles

LIVE ▶

Link 스마트 교수자료(배경지식 PPT)

B Speak Out

Complete the following with your ideas. Then take turns broadcasting the game to your group members.

배경지식 루지 vs 스켈레톤

루지는 썰매에 등을 대고 누운 채 얼음 트랙을 활주하여 시간을 겨루는 겨울 스포츠 경기이다. 경기는 1인승(상글)과 2인승(더블), 단체전 계주로 나뉘어 치른다. 반면에 스켈레톤은 머리를 정면으로 향하여 배를 대고 엎드린 자세로 썰매를 타고 얼음 트랙을 활주하는 스포츠이다. 썰매에 엎드려 머리부터 내려오기 때문에 루지보다 짜릿함을 맛볼 수 있으며, 그만큼 위험성도 높아 턱 보호대가 부착된 헬멧, 팔꿈치 보호대를 반드시 착용해야 한다. 스켈레톤은 남녀 각각 1인승으로만 경기를 치른다.



Viewers, welcome to the World Swimming Competition. The men's freestyle final will begin in a minute. There have been a lot of reports and expectations that Michael Johnson has the best chance of winning.

Will he be able to set a new record today? We'll see soon.

More & More 수영 종목

- Freestyle(자유형): 영법에 제한이 없는 수영으로 가장 빠른 영법
- Backstroke(배영): 등을 수면에 대고 두 팔을 번갈아 동그랗게 저으며 발로 발차기하는 영법
- Breaststroke(평영): 개구리 헤엄이라고도 불리며 비교적 안정된 품이기 때문에 먼 거리를 수영하기에 적합
- Butterfly(접영): 나비가 나는 모습과 같다는 데서 이름이 붙여진 것으로 운동량이 매우 큼

Peer-check

Exchange books and evaluate one of your group members' presentation.

Was the speaker's voice lively?	/ 5
Was the speaker's pronunciation clear?	/ 5
Was the comment appropriate for the game?	/ 5

Help Box

- 100m / 200m / 400m
- win the gold / touch the finish line first / break the Olympic record

Teaching Tips 발표 전 미리 평가 항목을 알게 하여 발표할 때 평가하는 항목을 잊지시킨다. 그 후 모둠원이 돌아가며 발표를 시작하게 한다.

Plus+ Speaking Worksheet (p.162 in Teacher's Material, 스포츠 경기 진행자로서 자신이 중계하고 싶은 스포츠 경기를 중계방송하는 내용으로, 수행평가 자료로 활용할 수 있다.)

A Get Connected

Do you like sports? Find out how much you know about sports.



- | | | |
|---|---|--|
| 1 | The world record in the men's 100-meter dash is 9.88 seconds.
단거리 경주 (→ 9.58) | ☐ ☒ |
| 2 | The warmer the temperature, the better the 100-meter race records. | ☒ ☐ |
| 3 | Curling is a winter sport played with five members on each team.
(→ A curling team is composed of four players except for in mixed doubles, where a team consists of two players.) | ☐ ☒ |
| 4 | Ball parks in lower areas allow more home runs than in higher areas.
(→ higher) (→ lower) | ☐ ☒ |

More & More 야구에 관한 흥미로운 사실들

- 고지대에서는 기압이 낮으므로 공의 공기 저항이 낮아 홈런이 더 많은 경향이 있다.
- 가을에는 여름보다 대기가 건조하고 습도가 낮기 때문에 홈런 확률이 높다.

B Vocabulary

Guess the meanings of the underlined words and talk about them with your partner.



She sweeps the floor every day to get rid of dust.
쓸다
~을 제거하다. 없애다



Try to find an optimal solution to all these problems.
최선의, 최적의



A sprinter runs a short distance race.
단거리 주자



If you spin the stick, friction makes heat that starts a fire.
마찰(저항)



She has such a long stride that it's hard to follow her.
걸음, 보폭



The power plants generate electricity for the city.
발생시키다.
만들어 내다

Plus+ Vocabulary Worksheet (p.163 in Teacher's Material)

Teaching Tips 본문 수업 전 과제로 내어 주어 미리 읽으면서 이해가 안 되는 부분은 체크해 오도록 지도한다.

Self-check Timed Reading

The more you read, the better you understand. Read the text (pp. 60-65) and record your reading time below.

1st ____ min. ____ sec.

* While reading, check where your understanding fails.

Overview 이 글은 스포츠를 과학 원리를 통해 들여다보는 세 개의 짧은 글로 구성되어 있다. 첫 번째 글은 100미터 달리기, 두 번째 글은 컬링 그리고 세 번째 글은 야구공에 작용하는 과학 원리를 소개하고 있다.

When Sports Meet Science

해석 스포츠와 과학의 만남
인간은 스포츠를 통해 놀라운 일들을 해낼 수 있다. 경기장을 가로질러 달리는 단거리 선수나 포수의 글러브 안으로 날아가는 야구공을 보라. 그들이 보여 주는 정확성과 힘은 마술처럼 보인다. 그러나 우리가 지구상에서 하는 모든 것은 자연의 법칙에 의해 지배를 받는다. 사실, 과학은 스포츠의 마법에 관해 많은 것을 설명할 수 있다.

Human beings are capable of doing amazing things through sports. Look at sprinters running through the field or baseballs flying into the catcher's glove. The precision and power they show seem like magic. Whatever we do on earth, however, is governed by the rules of nature. In fact, science can explain a lot about the magic in sports.

Teaching Tips 인과 관계 찾기

첫 번째 글은 100미터 달리기 에 관한 글이다. 주자의 땅을 박차는 힘과 내딛는 걸음의 수가 적절하게 조화를 이룰 때 최고 속도의 결과를 내게 된다는 인과 관계를 파악하도록 지도한다.

How Fast Can a Human Run 100 Meters?

Usain Bolt, the Jamaican sprinter, broke the world record for the 100-meter sprint in 2009, clocking a time of 9.58 seconds. Animals like the adult cheetah can run 100 meters in about six seconds. So what is the limit to how fast a human can run 100 meters?

Sports scientists say that sprinters' speed is influenced by how hard they hit the ground with their feet and by how many steps they take. Cheetahs do not hit the ground as hard as humans, but they can take twice as many steps as we do. This is why they can run fast.

해석 인간은 100미터를 얼마나 빨리 달릴 수 있는가?

자메이카 단거리 선수인 Usain Bolt(우사인 볼트)는 9.58초를 기록하며 2009년에 100미터 단거리 세계 기록을 깼다. 다 자란 치타와 같은 동물들은 100미터를 약 6초 안에 달릴 수 있다. 그러면 인간이 100미터를 얼마나 빨리 달릴 수 있는지에 대한 한계는 무엇일까?

스포츠 과학자들은 단거리 선수들의 속도는 발로 땅을 얼마나 세게 박차는지와 몇 보를 내딛는지에 영향을 받는다고 말한다. 치타는 사람만큼 강하게 땅을 박치지 않지만, 우리보다 두 배 많은 걸음을 내딛을 수 있다. 이것이 그들이 빨리 달릴 수 있는 이유이다.



Q1 Underline the two factors that influence sprinters' running speed.

Q2 Why do cheetahs run faster than humans?

It is because they can take twice as many steps as humans.

how hard they hit the ground with their feet, how many steps they take

More & More a number of와 the number of

- (a number of + 복수 명사 + 복수 동사): a number of는 '많은'이라는 뜻으로, 복수 취급한다.
 - (the number of + 복수 명사 + 단수 동사): the number of는 '~의 수'라는 뜻으로, 단수 취급한다.
- ex) A number of foreigners are in the train. 많은 외국인들이 기차에 있다.
The number of participants is restricted. 참석자들의 수가 제한되어 있다.

The problem for humans is that the harder they hit the ground, the more time they spend in the air, which makes their steps longer but reduces the number of steps they can take.

Therefore, maximum running speed is attained when the combination of force applied to the ground and stride frequency is optimal.

Unfortunately, this combination also depends on the runner's size, leg length, and other factors that vary among individuals. Many experts predict, however, that a human being could probably run the 100-meter sprint in just over nine seconds. Maybe future technology will help runners run even faster than they do today.

- attain
- apply
- stride
- frequency
- optimal
- vary

- focusing on taking longer steps (length-focused)



- focusing on taking a greater number of steps (frequency-focused)



When runners train, they use two methods as shown here. To attain the best performance, they should find the optimal combination of stride length and frequency.

해석 인간의 문제점은 땅을 세게 박찰수록 공중에서 더 많은 시간을 보낸다는 것인데, 이것은 보폭을 더 길게 만들지만 내딛는 걸음의 수를 줄인다. 따라서, 최대 달리기 속도는 땅에 가해지는 힘과 걸음의 빈도의 조합이 최적일 때 얻을 수 있다.

아쉽게도, 이 조합은 주자의 신체 사이즈, 다리 길이, 그리고 개인마다 차이가 있는 다른 요소들에 의해서도 영향을 받는다. 하지만 많은 전문가들은 인간은 9초 초반대에 100미터 단거리를 달릴 수 있을 것이라고 예측한다. 미래 기술은 아마도 주자들이 오늘날보다 훨씬 더 빠르게 달릴 수 있도록 도울 것이다.

Q3 It is important for a sprinter to find a balance between the force applied to the ground and the stride frequency to achieve the maximum running speed.

Teaching Tips 인과 관계 찾기

두 번째 글은 컬링 경기에 관한 글이다. 선수들이 컬링 스톤 앞의 빙판을 브룸(빗자루)으로 쓸어 스톤이 원하는 방향으로 나아가는 결과를 만들어 내게 된다는 인과 관계를 파악하도록 지도한다.

Why Do Curlers Sweep the Ice?

컬링 선수 쓸다, 빗질하다

- sweep
- broom
- furiously
- fist
- indicate
- curl

얼음 위에 물방울을 뿌려서
만든 작은 알갱이들

Did You Know?

Secrets of Curling Ice

The curling ice or *curling sheet* consists of small bumps made by sprinkling water drops on the ice. They reduce the contact surface between the stone and the ice.

접촉면

“Hurry! Hurry up!” Two people with brooms furiously sweep the ice in front of a rock that slides across a sheet of ice. “Whoa!” The sweepers stop as the rock settles into the house. “Nice job!” All four players bump fists indicating success. Have you guessed the sport? It’s called curling.

One might expect that a curling stone sliding across the ice would continue in a straight line according to Newton’s first law of motion.

However, the stone will begin to curl when it loses its speed even though it is three or four times as heavy as a bowling ball. This is why players have to direct the stone’s path carefully, and they do this by sweeping.

해석 왜 컬링 선수는 빙판을 쓰는가?

“서둘러 서두르라고!” 빗자루를 든 두 사람이 얼음판을 가로질러 미끄러져 나가는 돌 앞의 얼음을 맹렬히 쓸다. “오!” 그 돌이 하우스에 자리 잡자 스위퍼들은 멈춘다. “잘했어!” 선수들 네 명 모두 성공했다는 것을 표시하면서 주먹을 부딪친다. 당신은 이 스포츠가 무엇인지 짐작했는가? 이것은 컬링이다.

얼음을 가로질러 미끄러지는 컬링 스톤이 Newton(뉴턴)의 운동의 제1법칙에 따라 계속 똑바로 움직일 것이라고 예상할지도 모른다. 하지만 스톤은 볼링공보다 서너 배 더 무거울지 몰라도 속도를 잃으면 휘어 나가기 시작한다. 이것이 선수들이 스톤의 경로를 신중하게 유도해야 하는 이유이며, 그들은 빗질을 해서 이것을 해낸다.

배경지식 컬링

각각 4명으로 구성된 두 팀이 빙판에서 둥글고 납작한 돌(스톤)을 미끄러뜨려 표적(하우스) 안에 넣어 득점을 겨루는 경기이다. 스톤이 나아가는 동안 2명의 선수가 스톤이 지나가는 얼음길을 브룸(broom)이라고 하는 빗자루 모양의 솔을 이용해 닦아서 스톤의 진로와 속도를 조절한다. 이를 스위핑(sweeping)이라 하고 2명의 선수를 스위퍼(sweeper)라고 부른다. 하우스 중심에 스톤을 가장 가까이 붙이는 팀이 이기는 경기이며, 상대 스톤보다 하우스 중심으로부터 가까운 스톤에 해당 1점씩의 점수가 부여된다. 예를 들어, 하우스의 중심으로부터 상대방의 가장 가까운 스톤의 거리 안에 우리팀의 스톤이 2개가 들어 있다면 2점을 획득하는 방식이다.

Q4 What is the purpose of the first paragraph?

✓ a to introduce a new topic

b to describe the rules of a game



The heat generated by the sweeping melts the ice, which reduces friction. Reduced friction helps the stone move farther.



해석 얼음을 브room으로 문질러서, 스위퍼들은 스톤과 얼음 사이의 마찰을 줄이기 위해 열을 발생시킨다. 이것은 스톤이 더 똑바로 더 멀리 나가게 만든다. 스위퍼들이 멈추면, 스톤은 다시 휘어 나가기 시작한다. 컬링 선수들이 스톤을 겨냥하는 곳인 하우스가 상대의 스톤에 종종 막힐지라도, 컬링 팀들은 사실 스톤 하나를 다른 스톤 뒤에 유도할 수 있고, 이는 경기의 주요 전략적 요소들 중의 하나이다. 팀이 스톤의 방향과 속도를 어느 정도까지 정확하게 제어할 수 있는가가 경기의 전략에 있어서 중요한 하나의 요소이다.

By rubbing the ice with the broom, the sweepers are generating heat to reduce friction between the stone and the ice. This results in the stone going straighter and farther. If the sweepers stop, the stone begins to curl again. Although the house—the area where the curlers aim the stone—is often blocked by an opponent’s stone, curling teams can actually guide one stone behind another, which is one of the major strategic elements to the game. The precision with which the team can control the direction and speed of the stone is a major factor in the strategy of the game.

Reading Strategy

Identifying Cause & Effect

Identifying cause-effect relationships helps you to think analytically. While you read, think about what effects sweeping has on the curling stone. (→ Q5)

Teaching Tips 인과 관계 찾기

원인과 결과를 표현하는 어구를 이해시키고, 글에서 원인과 결과를 찾게 하여 글을 분석적으로 읽을 수 있도록 지도한다.

- rub
- generate
- friction
- result in
- opponent
- strategic

Q5 Complete the cause-effect relationships between sweeping and the stone.

[sweeping the ice → generates heat → melts the ice into water → reduces friction between the stone and the ice → the stone goes straighter and farther]

Teaching Tips 인과 관계 찾기

이 글은 야구공의 실밥의 역할에 관한 글로, 야구공의 실밥으로 인해 우리가 야구공을 더 빠르게 그리고 더 정확히 던질 수 있다는 인과 관계를 파악하도록 지도한다.

Why Does a Baseball Have Stitches?

실밥

The batter swings and hits a foul ball into the stands. You reach up with your glove and catch it as other spectators clap and cheer. You look at the baseball with its smooth leather covering and bright red stitches. Do the stitches serve a purpose other than to keep the leather covering over the ball?

A typical baseball has 108 double hand stitches. They serve more than just a decorative function. The stitches on a baseball actually affect the flight of the ball. Without them, a pitcher couldn't throw it as fast or as accurately.

- stitch
- batter
- spectator
- serve
- decorative
- pitcher

▶ **More & More** without이 쓰인 가정법 과거

〈Without + 명사 ~, 주어 + 조동사 과거형 + 동사원형〉에서 Without은 '~이 없다면'의 뜻의 전치사로, if절의 역할을 할 수 있다. Without 대신 But for, If it were not for를 쓸 수도 있다.

ex) Without water, nothing could live. 물이 없다면 아무것도 살 수 없을 것이다.
= But for (if it were not for) water, nothing could live.

해석 왜 야구공에는 실밥이 있는가?

타자가 방망이를 휘둘러 관중석으로 파울볼을 친다. 당신이 당신의 야구 글러브를 끼고 팔을 뻗어 그것을 잡자 다른 관중들이 박수 치고 환호를 한다. 당신은 부드러운 가죽 외피와 밝은 적색의 실밥이 박힌 야구공을 본다. 실밥은 가죽 외피를 공에 덮어 두는 것 이외의 도움을 주는가?

보통의 야구공에는 손으로 바느질한 108개의 이중 실밥이 있다. 그것들은 단순한 장식 기능 이상의 역할을 한다. 야구공의 실밥은 실제로는 공의 비행에 영향을 끼친다. 그것들이 없으면 투수는 공을 그만큼 빠르게 또는 정확하게 던질 수 없을 것이다.

Q6 What does *them* in line 11 refer to? **the stitches on a baseball**

Q7 The stitches on a baseball help the pitcher throw the ball **fast** and **accurately**.

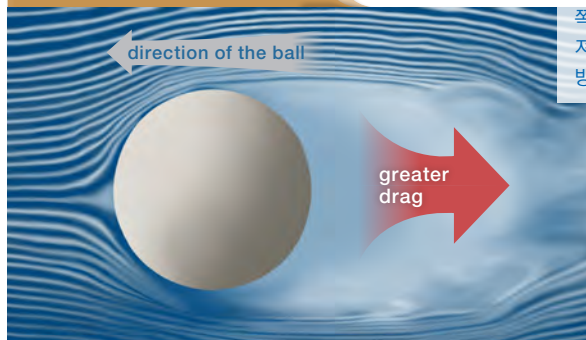
When a round object like a ball is thrown, the front part of the ball hits the air, increasing the air pressure there while the air becomes thinner at the back of the ball, making the air pressure low. This difference in air pressure creates an unwanted effect called “drag” that literally drags the ball backward and slows it down. This is where the stitches come into play.

The stitches more or less scoop the air and direct it inwards towards the back of the ball. This effectively increases the net air pressure at the back of the ball, which reduces the drag. Further, as a baseball is released, the pitcher can put spin on the ball. As the ball spins, the stitches help the ball to fly in the direction the pitcher intends.

- drag
- literally
- come into play

- scoop
- net (a.)
 - ↳ net이 형용사로 쓰일 때 다음의 뜻이 있다.
 - ① 순- a net profit 순이익
 - ② 살- net weight (용기 무게를 뺀) 실중량

A Ball Without Stitches



The shading at the back of each ball represents the lower air pressure zone, showing how the stitches work to weaken drag by catching the surrounding air and directing it inwards.

Stitches scoop up the air inwards towards the back of the ball.

Self-check

- | | |
|---|-----|
| I can see the cause-effect relationships in the text. | / 5 |
| I understand how science works in each sport. | / 5 |

- Read the text again and record your reading time.
2nd ____ min. ____ sec.
- Read More! Go to page 148.

Teaching Tips 본문 수업 후 과제로 내어 주어 다시 읽고 시간을 기록해 오도록 지도한다.

Plus+ Further Questions for Reading (p.164 in Teacher's Material)

- Q8** How do baseball stitches reduce the effect of drag? **Stitches reduce the drag by directing the air inwards towards the back of the ball.**
- Q9** **How about you?** Which scientific concepts behind the three sports did you find most interesting?

Sample Curling was most interesting to me. After reading the text, I realized how important sweeping is in curling matches.

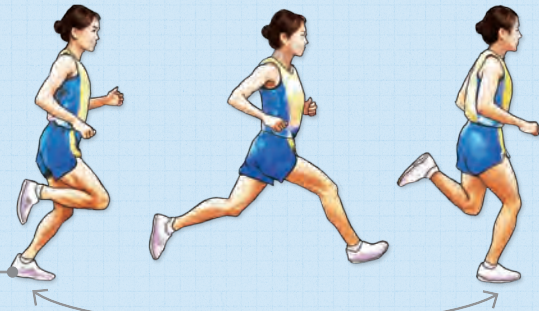
After You Read

Teaching Tips 본문에 소개된 100미터 달리기, 컬링, 야구공에 작용하는 핵심적인 과학 원리를 요약하게 한 후, 짝과 얘기해 보게 한다.

A Fill in the blanks with the given words to describe the pictures below.

100m sprint

The ¹⁾ force you apply to the ground determines how long you stay in the air.



The longer you stay in the air, the fewer ²⁾ steps you take.

Curling

Without sweeping, the stone will ³⁾ curl.



Sweeping the ice in front of the stone makes it go ⁴⁾ straight.

Baseball

The difference in air pressure creates ⁵⁾ drag.

high air pressure area



low air pressure area

⁶⁾ Stitches catch the surrounding air and fill the back area with the air.

WORDS

stitches

force

drag

curl

steps

straight

Teaching Tips 본문에 소개된 컬링에 작용하는 과학 원리를 바탕으로 한 대화문이다. 학생들이 인과 관계를 잘 파악해 문장의 순서를 연결하도록 지도한다. 대화를 완성한 후 짝과 함께 자신의 말로 컬링의 원리에 관해 대화해 보게 한다.

B Number the sentences about curling in order. Then practice the dialog with your partner.

1 I still wonder why the players bother to sweep the ice with brooms. 애써서 ~하다

2 That's because if the stone is left alone, it begins to curl.

5 A-ha! Then there must be some water between the ice and the stone.

6 Exactly. The water makes the stone go farther.

3 Right, but I don't understand exactly what happens when they sweep the ice.

4 As far as I know, sweeping the ice creates friction, and this friction generates heat, which then melts the ice.

7 Now I get it.



Teaching Tips 본문 내용을 기초로 야구공의 실밥에 관한 짧은 기사문을 완성하도록 지도한다.

C Complete the following passage using the given phrases.

Did You Know?

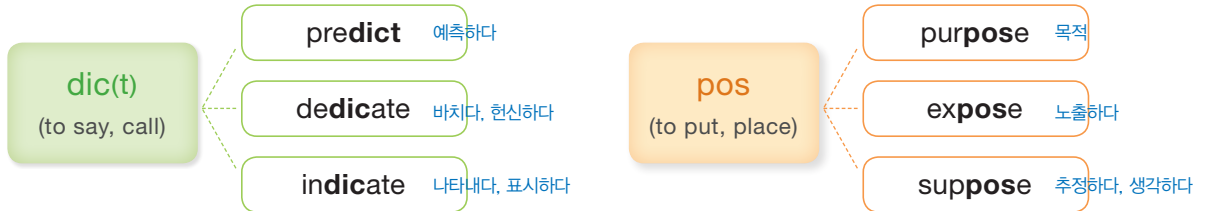


Hand Stitches on a Baseball

Did you know stitches on a baseball are not there just for decoration? They play an important role. They reduce the drag effect and make the ball fly faster. Like all other things in the world, there is a purpose behind what we see.

- reduce the drag effect
- fly faster

A Word Forms



Complete each sentence with a word from above. Change the form if necessary.

- Don't expose your skin to the sun for too long. It could cause damage to your skin.
- Economic analysts predicted in their latest report that the domestic manufacturing industry will recover soon.
경제 분석가 국내 제조 산업
- The statistics indicate that the sales of furniture increase during the Christmas season.
통계
- The purpose of this article is to convince readers to make a donation for the construction of the memorial hall.
기념관 설득하다

More Sentences

- She **dedicated** her life to the preservation of nature.
- I **suppose** it doesn't hurt to try his idea.

B Expressions in Use

- **be capable of** to be able to do or achieve something
~할 수 있다
- **come into play** to start to happen or have an effect
작동(활동)하기 시작하다
- **result in** to produce something or to lead to a certain outcome
(결과적으로) ~을 낳다, 야기하다 결과

Complete each sentence with an expression from above. Change the form if necessary.

- The heavy rain resulted in several transportation delays last night.
- I think I am capable of performing the jobs described in this document.
- Don't let your personal emotions come into play when you make decisions on public matters.
공적인 일

✔ **Self-check** Make your own sentence, using one of the expressions above.

Plus+ Vocabulary Test (p.167 in Teacher's Material)

C Grammar in Use

▶ 원급을 이용한 배수 표현

원급을 사용해서 배수를 표현하는 방법에는 <배수사 + as + 원급 + as ~>와 <배수사 + the 도량형 명사 + of ~>가 있으며, 또한 <배수사 + 비교급 + than ~>으로도 표현할 수 있다.

ex) Elvin is **three times as old as** his daughter.

= Elvin is **three times the age of** his daughter.

= Elvin is **three times older than** his daughter.

Link 스마트 교수자료
(문법 PPT)

Point 1

- Adult cheetahs can take **twice as** many steps **as** we do.
- The curling stone is **three or four times as** heavy **as** a bowling ball.

cf. This is twice **as big as** that. = This is twice **the size of** that.

Reshuffle the words in parentheses to complete the paragraph.

How many calories do you burn when you sit, stand, or walk? A recent study of office workers revealed an interesting finding. Sitting and standing turned out to burn almost the same calories per hour. Walking, however, was different: It burned ^{조사 결과} ^{~하는 것으로 드러나다} ¹⁾(as / many / twice / calories / as) sitting or standing. Now, given the fact that running burns about ^{~을 고려할 때} ²⁾(of / the calories / three or four times) walking, you have an answer to a healthy life: Run!

▶ 관계부사

관계부사는 두 문장을 하나로 연결하는 <접속사 + 부사>의 역할을 한다. 관계부사가 이끄는 절은 선행사를 꾸미는 형용사절로 선행사가 장소이면 관계부사 **where**, 시간이면 **when**, 이유이면 **why**가 오며, 방법을 나타낼 때는 선행사 **the way**는 **how**와 함께 쓸 수 없고 둘 중 하나만 써야 한다.

ex) Most people were at home, and this was the time **when** the fewest trains were running.

대부분의 사람들은 집에 있었고 이때가 가장 운행 수가 가장 적은 때였다.

Point 2

Link 스마트 교수자료
(문법 PPT)

- Cheetahs can take twice as many steps as we do. This is **why** they can run fast.
the reason
- The stone will begin to curl. This is **why** players have to direct the stone's path carefully.
the reason

cf. This is (the place) **where** they first met.

• Today is (the day) **when** I was born.

✓ **Self-check** Skim through page 148 and underline the sentence with the structure above.

Teaching Tips 148쪽의 Read More!를 읽으며 해당 문법을 찾아보게 지도한다.

Fill in each blank with **where** or **why**.

1 **A** Let me go over your résumé. You were born in Seoul, right?

B No, that's not where I was born. I'm from Busan.

2 **A** I heard that cats are extremely sensitive to light.

B Yeah, it's true. That's why they can see in the dark.

Plus+ Grammar Worksheet (p.168 in Teacher's Material)

A Get Ideas

If you were allowed to form a new sport club at your school, which sport would you choose? Read and check.

8
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Ultimate Frisbee

프리스비

a full body exercise



Benefits

- social interaction
- increased endurance 지구력 향상

Toss and Catch the Frisbee in the Open Field!

Cheerleading

a perfect team sport



Benefits

- leadership development
- strong joints and muscles 관절과 근육 강화

Spread Your Happiness to Others!

Skateboarding

a sport of coordination



Benefits

- muscle building 근육 만들기
- improved balance

Dash through the Park on a Skateboard!

B Organize Ideas

Write about your plan for a recruitment flyer about the sport you chose.

- How would you define the sport you chose?
→ Cheerleading is a perfect team sport.
- What are the health benefits of the activity?
→ You can develop leadership and build strong joints and muscles.
- Who do you want in your club?
→ We welcome those who are outgoing and sociable.
- Which day, what time, and where do you plan to meet?
→ We will meet on Wednesdays, from 5 p.m. to 7 p.m. at school.

Teaching Tips 질문에 답한 후 자신이 홍보하고자 하는 교내 스포츠 동아리에 대해 짝과 함께 자유롭게 얘기해 보게 한다.

A Which sport did you choose, Sora?

B I chose cheerleading. I think it's a perfect team sport where I can develop leadership. How about you, Minsu?

A I chose Ultimate Frisbee. I'm somewhat shy, so I guess it'll help me to interact with others.

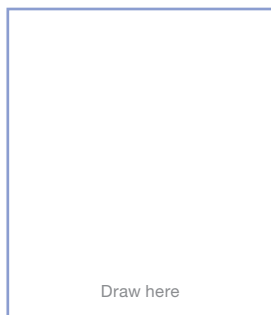
C Write

Based on your ideas, complete the flyer to promote your club.

Come and Join Us Now!

Cheerleading is a perfect team sport!

definition



Somang High School Cheerleading

Club has been newly formed and is looking for new members. By joining us, you get the chance to develop leadership while making new friends.

You can also build strong joints and muscles,
and be more active.

health benefits

We'll meet on Wednesdays, from 5 p.m. to 7 p.m. at school
this year. We welcome everyone, but those who are outgoing and sociable
will be particularly welcomed. If you're interested, please
feel free to contact Soyeon Kim at 010-1234-5678.

contact information

Let's spread our happiness to others!

Don't hesitate to sign up!

plus

catch phrases

해석 치어리딩은 완벽한 팀 스포츠입니다!

소망 고등학교 치어리딩 동아리가 새롭게 만들어져 신입 부원을 기다리고 있습니다. 저희와 함께하시면, 여러분은 새로운 친구들을 사귀면서 리더십을 가질 수 있는 기회를 얻게 됩니다. 여러분은 또한 관절과 근육을 강화시킬 수 있으며 더 활동적인 모습이 될 수 있습니다.

올해는 학교에서 수요일 오후 5시에서 7시 사이에 모일 것입니다. 누구나 환영하지만 외향적이고 사교적인 분들은 특별히 환영합니다. 관심이 있다면 부담 없이 010-1234-5678 번호로 김소연에게 연락주세요.

우리의 행복을 다른 사람들에게 전파합시다! 주저하지 말고 가입하세요!

Writing Tips words for catch phrases

- now is the time to ~
- share your passion for ~
- don't hesitate to ~
- seize the opportunity to ~

✓ Peer-check

STEP 1 Exchange books and evaluate your partner's flyer. Leave comments where necessary.

Is the flyer inviting overall?	/ 5
Does the flyer have all the necessary information?	/ 5

STEP 2 Revise your flyer based on your partner's feedback.



A Listen and answer the questions.

1 What is the boy most likely to do after the dialog? **W** I strongly recommend it. You won't regret it.

- ① buy new running shoes
- ② download the running application ✓
- ③ search for new running routes 길, 경로
- ④ sign up for a fitness program ~을 신청하다

2 Which picture best illustrates how basketball was played in the past?



- 2 **M** Erika, did you play basketball again? You're soaked in sweat.
W Yeah, you know me. I play all the time! I love the teamwork and the running around. It feels great when a play works, too.
M Oh, I bet. I feel the same when I play soccer. You know, I was just reading that people used to play basketball with a soccer ball back in the day.
W Really?
M What's more interesting is that in those days, balls were shot at wooden baskets that were closed at the bottom.
W Do you mean players had to get the ball out of the basket every time someone scored?
M Yeah, they stepped up on a ladder to get it out and continued playing.
W How strange! That sounds like a lot of work!
M You're lucky you don't have to go through that trouble anymore.



B Complete the dialog using the given sentences and practice it with your partner.

- 3 **A** Hurrah! The Korean archery team won all of the gold medals!
B Unbelievable! I wonder how they can be so successful.
A They shoot more than 1,000 arrows a day. But that's not the only secret.
B Do you mean there's something else behind their success?
A Definitely. Athletes use advanced equipment and receive psychological treatment during their training, too. 발전된 장비 심리 치료
B Now I understand why Korean archers have stayed on top.



- a Now I understand why Korean archers have stayed on top.
- b Do you mean there's something else behind their success?
- c Unbelievable! I wonder how they can be so successful.

Teaching Tips 대화를 완성한 후 파트너와 대화해 보도록 지도한다. 그 다음에는 자신의 말로 대화할 수 있도록 지도한다.



C Read the passage and answer the questions.

A typical baseball has 108 double hand stitches. They serve more than just a decorative function. The stitches on a baseball actually affect the flight of the ball. Without them, a pitcher couldn't throw it as fast or as accurately.

When a round object like a ball is thrown, the front part of the ball hits the air, (A) the air pressure there while the air becomes thinner at the back of the ball, making the air pressure (B). This difference in air pressure creates an unwanted effect called "drag" that literally drags the ball backward and slows it down. This is where the stitches come into play.

4 Which pair of words best fits in (A) and (B)?

- | | | | |
|---------------------|-----|----------------------|-----|
| (A) | (B) | (A) | (B) |
| ① increasing – high | | ✓ ② increasing – low | |
| ③ decreasing – high | | ④ decreasing – low | |

5 What would the paragraph that follows deal with?

- ✓ ① the role of baseball stitches ② differences between baseballs and basketballs
 ③ how the drag effect works ④ the complex process of making baseball stitches

해설 지문의 마지막 문장의 내용을 고려할 때, 다음에는 실밥의 역할에 관한 내용이 이어져야 한다.



D Read the passage and write your answers.

One might expect that a curling stone sliding across the ice ① would continue in a straight line according to Newton's first law of motion. However, the stone will begin to curl when it ② loses its speed even though it is three or four times as ③ heavy as a bowling ball. This is ④ what players have to direct the stone's path carefully, and they do this by sweeping.

6 Find the grammatically incorrect word among ① ~ ④ and fix it.

① what → why

7 Write the meaning of do this.

→ direct the stone's path

✓ Self-check Which question(s) did you miss?

Listening	Speaking	Reading	Writing
1	2	3	4
5	6	7	

What do you need to review?:

My Learning Log

Looking back at what I learned in this lesson will help me become a better learner!

Look through the Self-checks and Peer-checks, and rate your learning below.



My Learning

I have realized that sports are related to science.	☹️ 😐 😊
I had a chance to better understand scientific concepts in running, curling, and baseball.	☹️ 😐 😊
Overall, I am better able to understand scientific texts.	☹️ 😐 😊

- What sports facts do you want to find more information about?

ex) After reading the text about baseballs, I got curious if the same scientific rules work for a golf ball.

Sample After reading the conversation about yoga, I got curious about the health benefits of it.



My Attitude

Did I read or listen again when I couldn't understand?	☹️ 😐 😊
Did I refer to the visual aids included in the text for better understanding?	☹️ 😐 😊
Did I give positive feedback to my partners or group members when necessary?	☹️ 😐 😊

- What will you do differently next time?

ex) I think I need to get used to looking at things from a scientific point of view.

Sample I suppose I need to use the visual aids more for better understanding.

10차시
수업 자료

스마트 교수자료

STEP 1

Gather & Research

Make a group of three. Search the Internet to find out about various sports-related jobs and choose one your group will make a presentation about.

** Gather information about the job you chose to make presentation slides in the next step.

STEP 2

Discuss & Design

Discuss what to include in your presentation and make presentation slides.

** Discuss what kinds of visual aids to include.

** You may use video or audio clips if you wish.



STEP 3

Present & Evaluate

Give a presentation to your class and evaluate other groups' work. Then vote for the best one!

Sports Career

Search

▶ a soccer coach



▶ a physical therapist

물리 치료사



▶ a sports agent



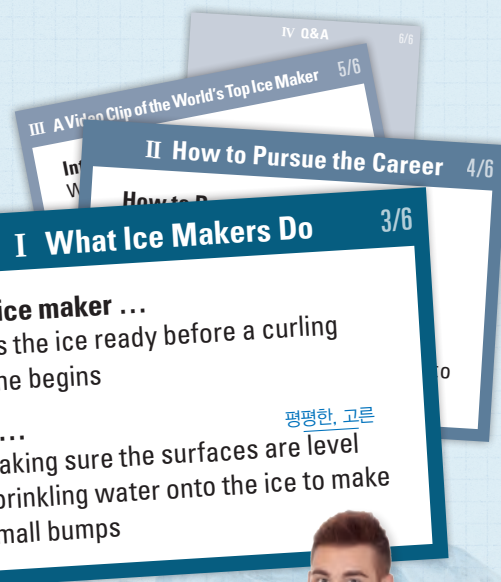
▶ a sports journalist



▶ an ice maker for curling



your own

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CONTENTS		2/6
I	What Ice Makers Do	
II	How to Pursue a Career in Ice Making	
III	A Video Clip of the World's Top Ice Maker	
IV	Q&A	

I What Ice Makers Do 3/6

An ice maker ...
gets the ice ready before a curling game begins

by ... 평평한, 고른

- making sure the surfaces are level
- sprinkling water onto the ice to make small bumps

	Group 1	Group 2	Group 3	Group 4
Is the presentation informative?	/ 5	/ 5	/ 5	/ 5
Is the speech appropriate in speed and tone?	/ 5	/ 5	/ 5	/ 5
Are the slides visually attractive?	/ 5	/ 5	/ 5	/ 5