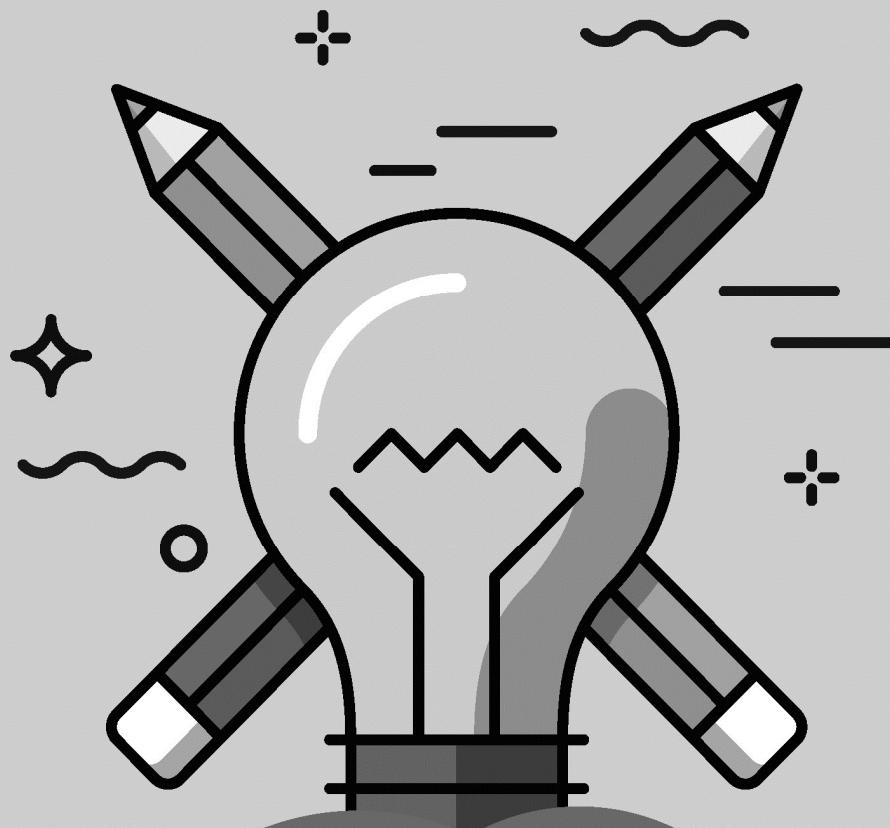


2020

교과서 속 블렌디드 발명수업



인천광역시교육청

INCHEON METROPOLITAN CITY OFFICE OF EDUCATION

발간사



가

가

가

가

19

가

가

가

2020 11

CONTENTS

교과서 속 블렌디드 발명수업



1.	.....	1
2.	.....	17
3. 가 !	.....	43
4.	.....	64
5.	.....	86
6.	.....	109
7. LED	.....	130
8. 3D	.....	151
9. 3D	.....	171
10. Autodraw	.....	188



6 : [6 13-01],

6 : [6 05-06]

6 : [6 02-02]
[6 02-03]

[6 03-04] ()

1. 가
- 2.
- 3.

1. 가
- 2.
- 3.

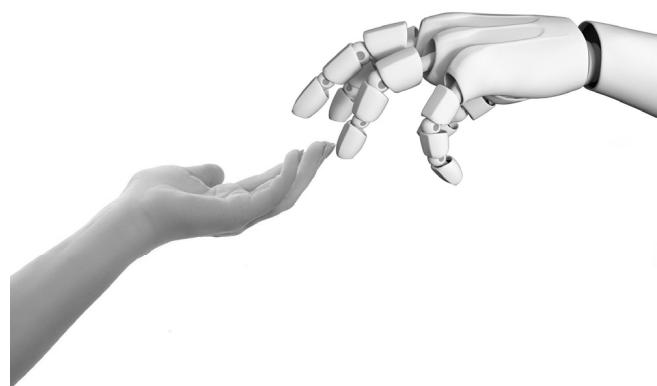


가

(AI, articial intelligence)

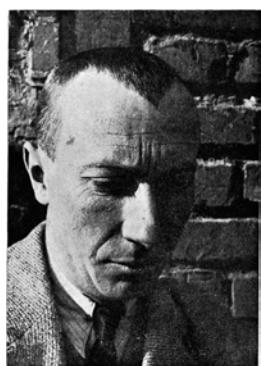
가

가? 가? , 가?
가 ?



활동 1 창의적인 화가 알아보기

1.



가 가
」
, 가

2.

(<https://www.vingle.net/posts/714592>)

가

3.

가
가
(dripping:)

No.5

2013 14 4 (1660)

가

(<https://youtu.be/oI00os-1Lsg>)

가

4.

가

3



1)

5.

가
가 가
가

가

1) <https://pixabay.com/images/id-3554980/>



' (1917)²⁾

활동 2 인공지능이 그림 그리는 세상

4

MIT

(CARLO RATTI)

(SCRIBIT)

가 8.6 , 6.9
· , , , , , 4가

(https://youtu.be/t59pK_PUzwU)

(<https://youtu.be/djcOi8Ekkr4>)

(<https://www.youtube.com/watch?v=3VKHRPgIPh0>)

2) <https://upload.wikimedia.org/>

활동 3 그림 그리는 로봇 제작하여 그림 그리기

1. ()

() 가 .
가 .

2.

CD, , , , , , ,

3.

가. (), , .



1.5V 2

1 가 .
가 .

가
가

CD

(

)



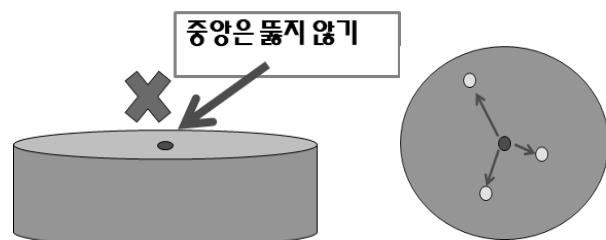
가 cd

cd

가 cd

()

가



CD

()

4

(

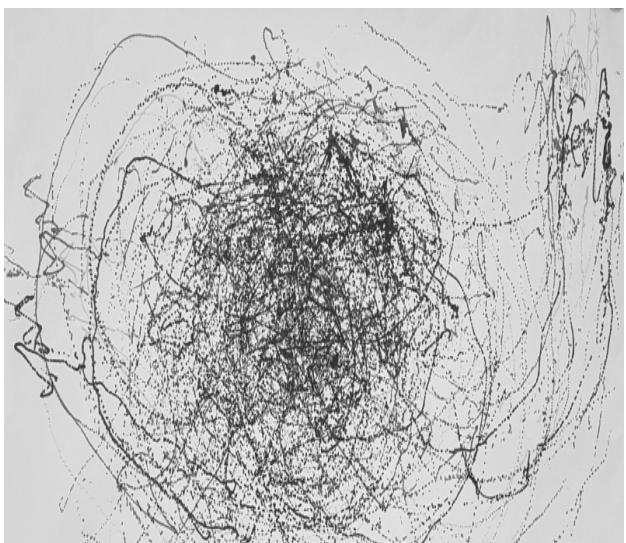
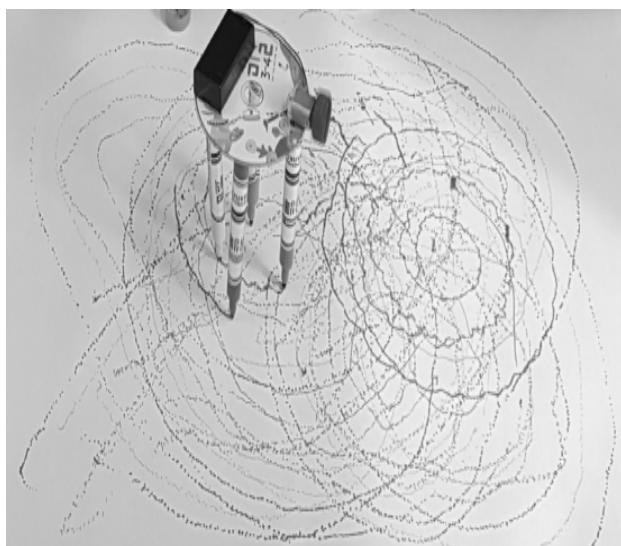
)



4.

가.

가

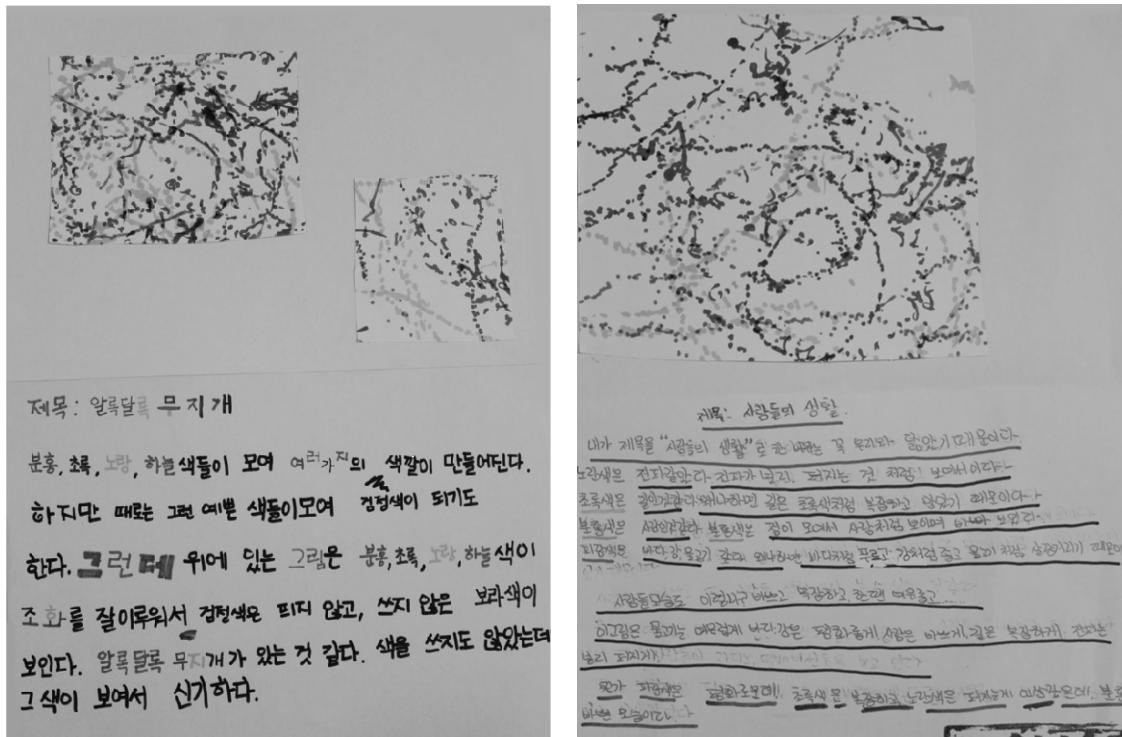


<

>

<

>



6 2 1

가

6

5, 6

<

>

그림 그리는 로봇으로 그린 그림

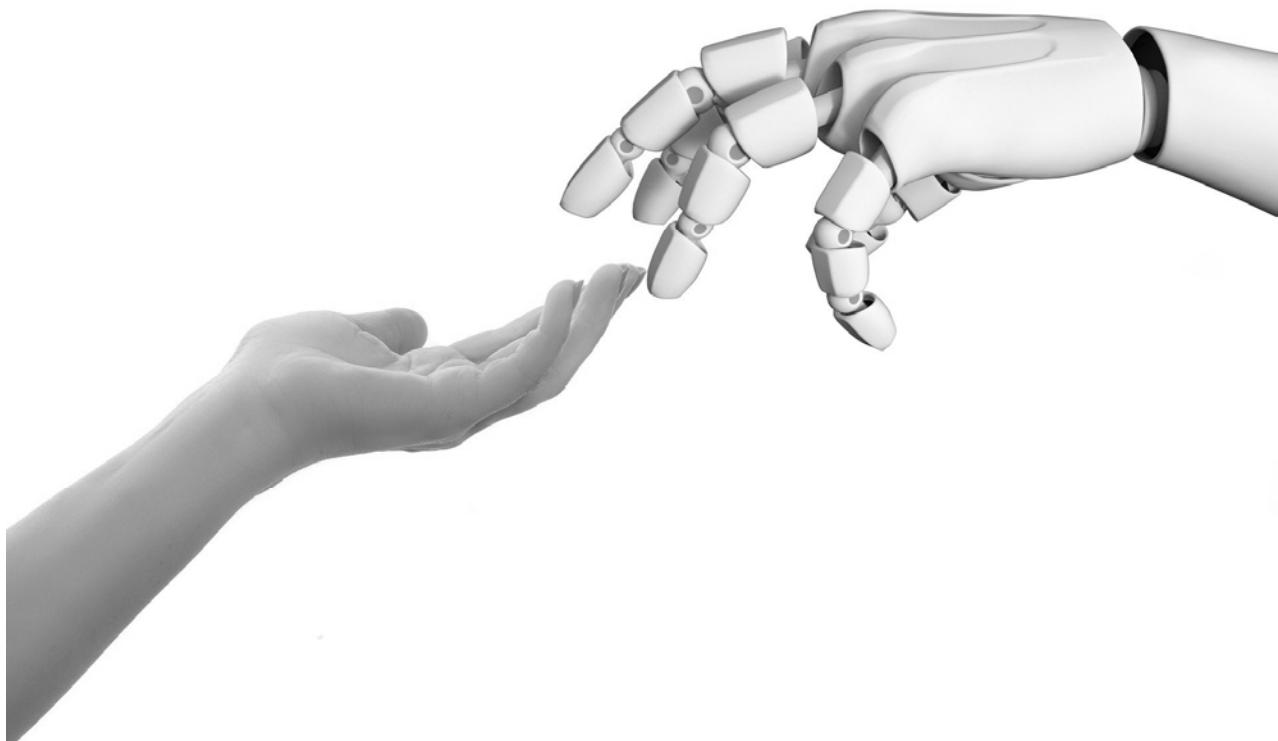
:

:

:



?
(AI, articial intelligence) 가 가
, 가
가? ‘ 가?
, 가
가 ?



활동

1

창의적인 화가 알아보기

1.



가

가

가

2.

가

3.

가

가

(dripping:)

No.5

가

2013

14 4

(1660)

가

4.

가

3



3)

5.

가
가 가
가

가



' (1917)⁴⁾

3) <https://pixabay.com/images/id-3554980/>

4) <https://upload.wikimedia.org/>

활동 2 인공지능이 그림 그리는 세상

4

MIT

(CARLO RATTI)

(SCRIBIT)

가 8.6 , 6.9 , , , , , 4가

활동 3 그림 그리는 로봇 제작하여 그림 그리기

1. ()

() 가
가

2.

CD, , , , , , ,

3.

가 (), ,





1.5V 2

1 가

가
가

CD

(

.)



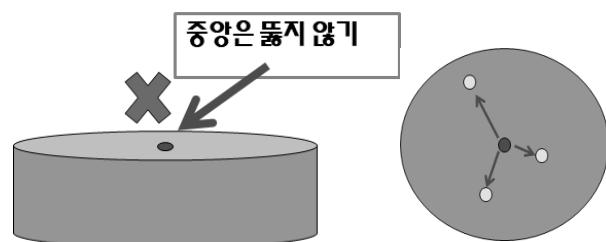
cd

가 cd

가 cd

()

가



CD

()

4

(

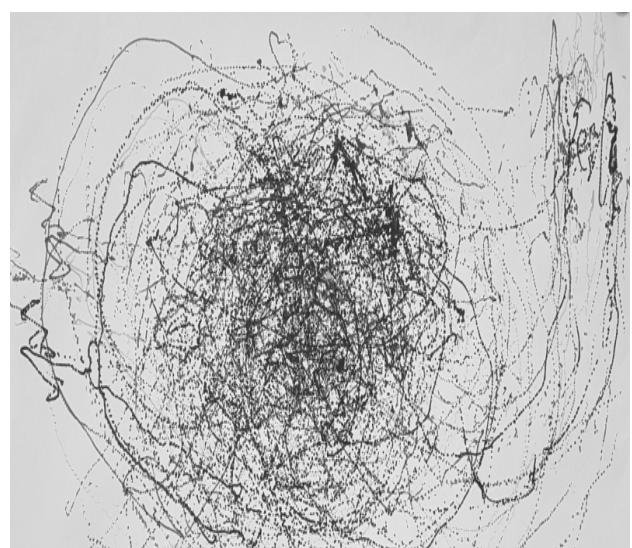
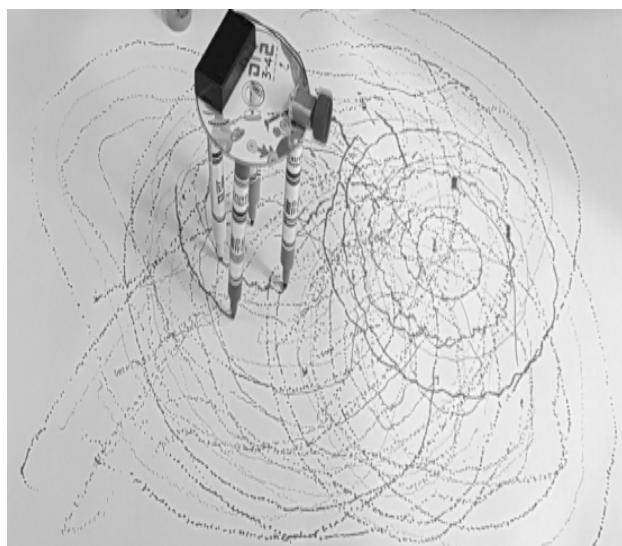
.)



4.

가.

가



<

>

<

>

<

>

그림 그리는 로봇으로 그린 그림

:

:

:



6 : [6 02-02]
[6 02-04] (, , , , , , , ,)

3 : [4 07-02] 가

5 : [6 07-01]

6 : [6 17-02] 가
,

1. 가
2. 가 가 가
3. 가
4. 가
- 5.

- 1.
- 2.
- 3.



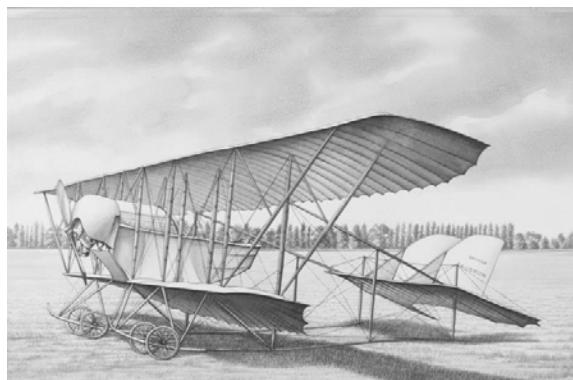
가 400 400,000kg
가 ?
1903 1

16 가 ‘ ’ ,

30

Tips []

<https://www.youtube.com/watch?v=QWzpOe2YM70>



활동

1

비행기를 날게 하는 힘

1.

가



가

가

)

가

(,

가

가

가

()

가

가

가

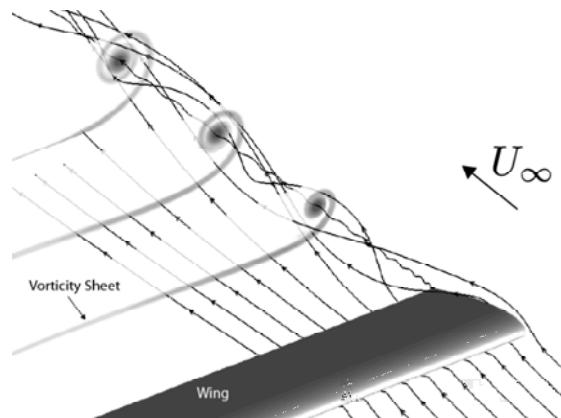
가



[]

<https://www.youtube.com/watch?v=baiqOtJMg78>

2.



5)

(

가

)가



[]

가

?

<https://www.youtube.com/watch?v=UTir24itbys>

5) https://ko.wikipedia.org/wiki/%ED%8C%8C%EC%9D%BC:Tip_vortex_rollup.png

활동 2

다양한 종이비행기 만들어 날려보기

1.

가 ?

, , , , 가 , , 가

1930

가 ,

가

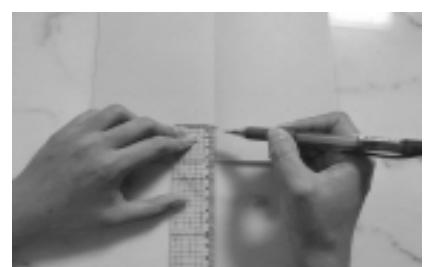
2.

, 1~2mm
가

가

가 가

가
가 가
가



1. A4

2.

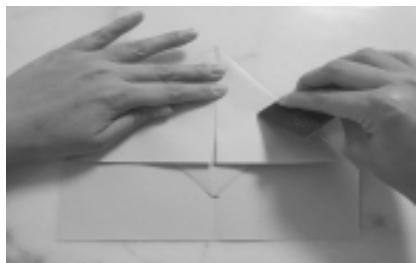
가 3.

3.3cm

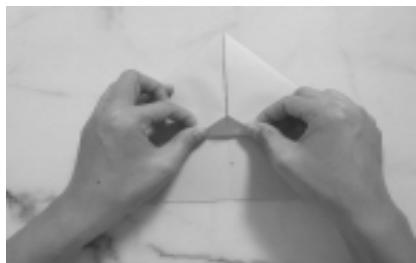
2mm



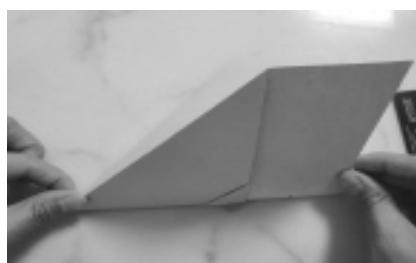
4.



5. 가
2mm



6. 가



7.



8.



9.

!

1)

 []

<https://www.youtube.com/watch?v=9W7EnnFhDlc>



1. A4



2.



3. 가

2mm



4.

1cm



5.



6. 가

1mm



7.



8.

1mm



9.



10. 가

)



(

11.

1.5cm



12.



13.



14.



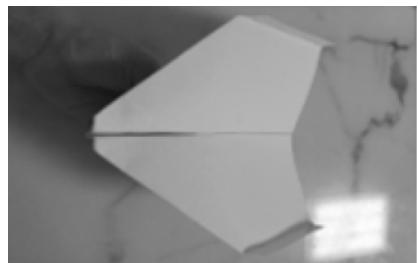
가

15.

1cm



16.
1cm



17.



18.

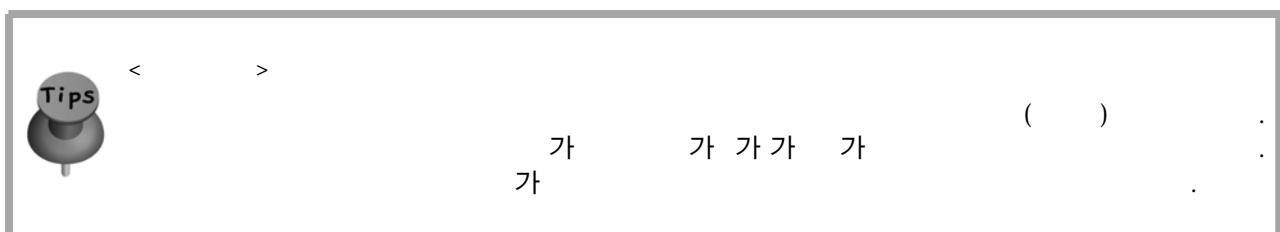


19.
가 Y



20.

!



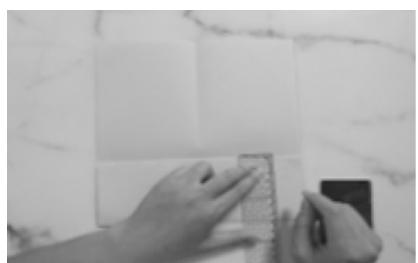
2) ()



1. A4



2. A4



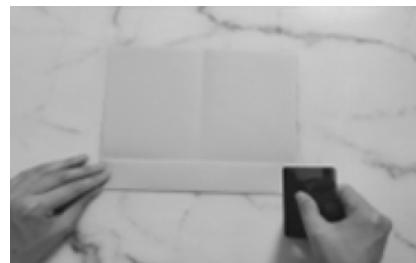
3.
3mm



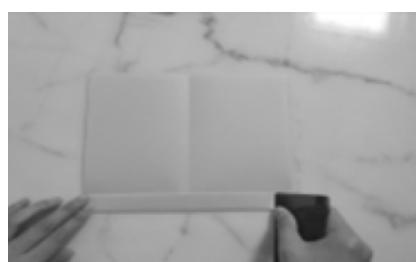
4.
1mm



5.



6.



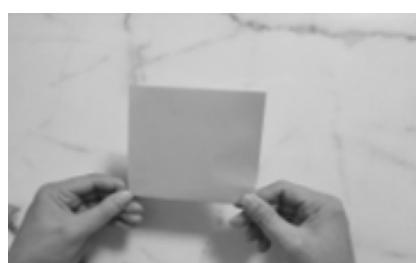
7.



8.



9.



10. 가
가



11. 가
1cm



12.



가 Y , 90

16. !



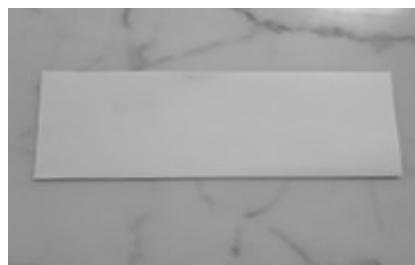
3)

()

()

가

가



1. 가

A4



2. 가

2mm

3.

1mm



4.

5.

6.

(
)



7.

8. 7



9.

가



10.



11.



12.



13.



14.



15.

!

3.

가

가

가

가 ?

?

가

,



< >
<https://www.youtube.com/watch?v=EBE5f6pBQ7A>
https://www.youtube.com/watch?v=_owuQ48nsG0
<https://www.youtube.com/watch?v=fC6dNmvl9Fg&t=93s>

1)

2)

3)

4)

가

5) 80

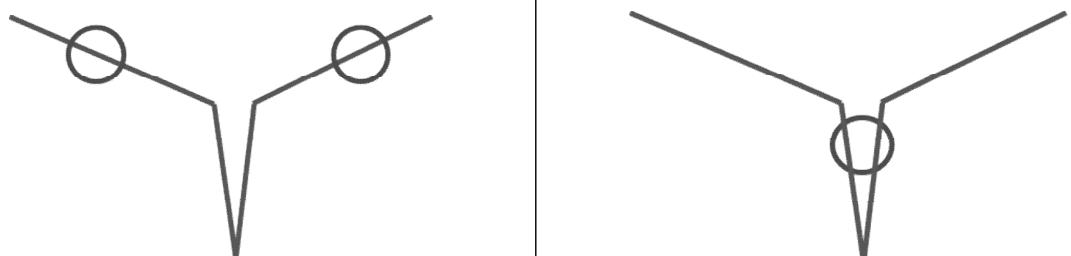
6) 30



	가	()
< , >		

가 ,
Y

가 ,
) ,
가 가 ,
‘ ,
가 ,
‘ ,
가



/ ()	/ ()
-------	-------

활동

3

나만의 창작 종이비행기 만들기

1.

가.

80~90g A4

가

가

가

가

2

A4 , , , 가 ()

4

3 (3-1-2)

가

가

$$5 \quad (5-2-4)$$

$$6 \quad (6-2-5) \quad)$$

가

나만의 창작 종이비행기 만들기

	- , , ,
	- , , ,
	,



가 400
가 ,
1903 1

400,000kg

?

가 ‘ ’ ,

30



활동 1

비행기를 날게 하는 힘

1.

가



가.

가

)

가

가

가

가

가

()

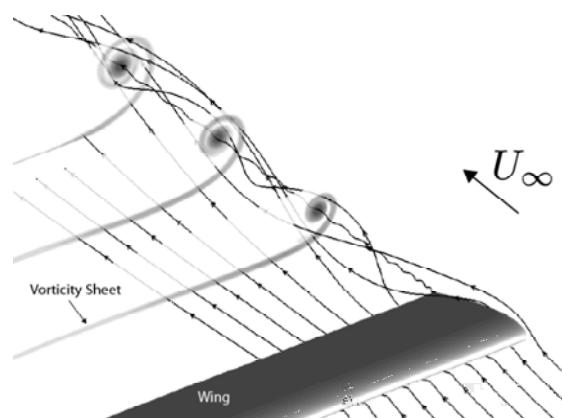
가

가

가

가

2.



6)

(

)가

가



6) https://ko.wikipedia.org/wiki/%ED%8C%8C%EC%9D%BC:Tip_vortex_rollup.png

활동 2

다양한 종이비행기 만들어 날려보기

1.

가 ?

, , , , 가 , , 가
가

1930

가 ,

가

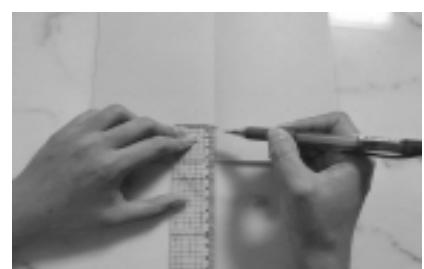
2.

, 1~2mm
가

가

가
가

가
가 가
가



1. A4

2.

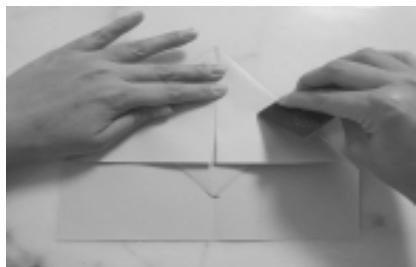
가 3.

3.3cm

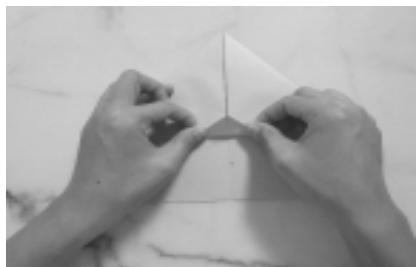
2mm



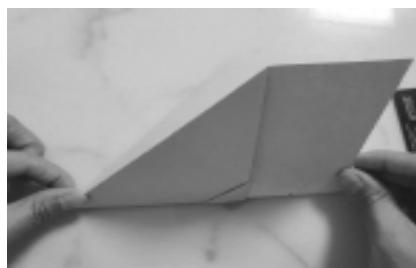
4.



5. 가
2mm



6. 가



7.



8.



9.

!

1)



1. A4



2.



3. 가

2mm



4.

1cm

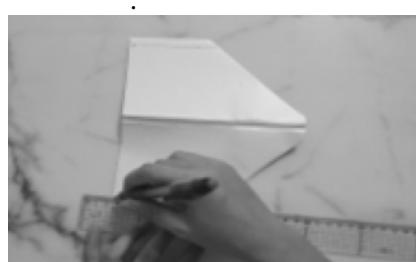


5.



6. 가

1mm



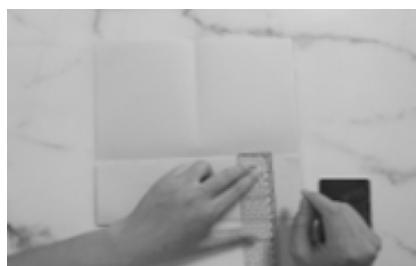
2) ()



1. A4



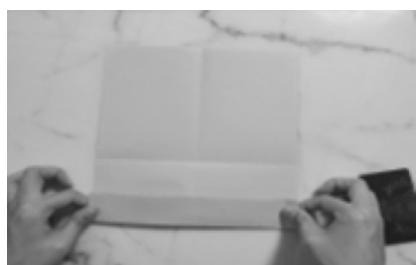
2. A4



3.
3mm



4.
1mm



5.



6.



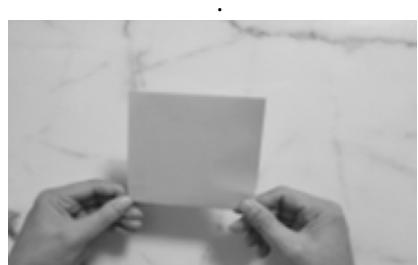
7.



8.



9.



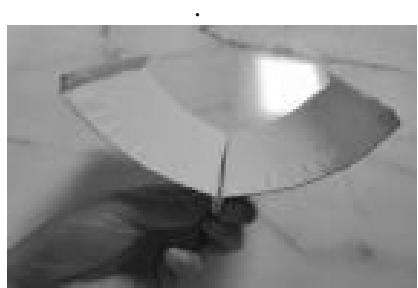
10. 가
가



11. 가
1cm



12.



16.

!

가 Y , 90

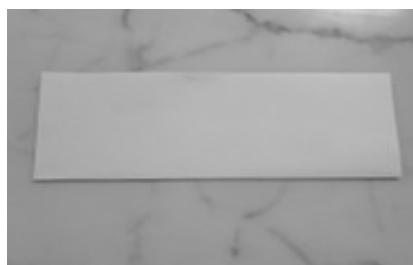
3)

()

()

가

가



1. 가



A4

2. 가

2mm



3.

1mm



4.



5.



6.

()



7.



8. 7



9.

가



10.



11.



12.



13.



14.



15.

!

3.

가

가

가

가 ?

?

가

1)

2)

3)

4)

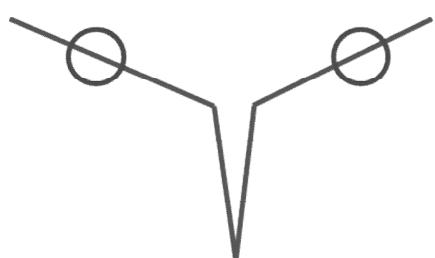
가

5) 80

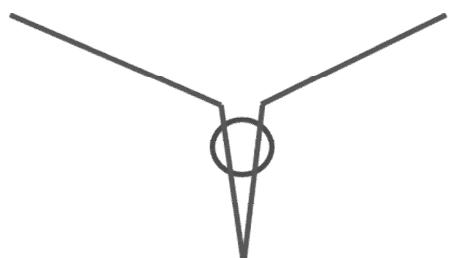
6) 30



	가	()
<	,	>



/ ()



/ ()

활동 3

나만의 창작 종이비행기 만들기

1.

가.

80~90g A4

가

가

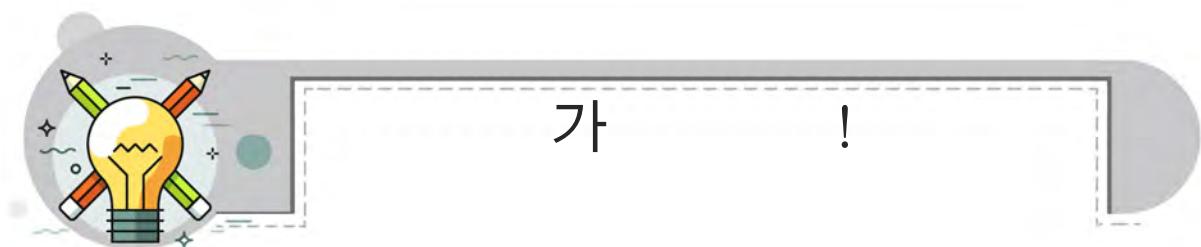
가

가

2.

A4 , , , 가 ()





3	: [4 08-01]	가	가	가
	[4 08-02]	.	.	.
3	: [4 01-10]	.	.	.
	[4 01-11]	,	,	,
3	: [4 01-01]	.	.	.
	[4 01-06]	.	.	.

	1.	.
	2.	.
	3.	가

	1. 2. , 3. 가
--	--------------------



가

가

. 3 5

가

가

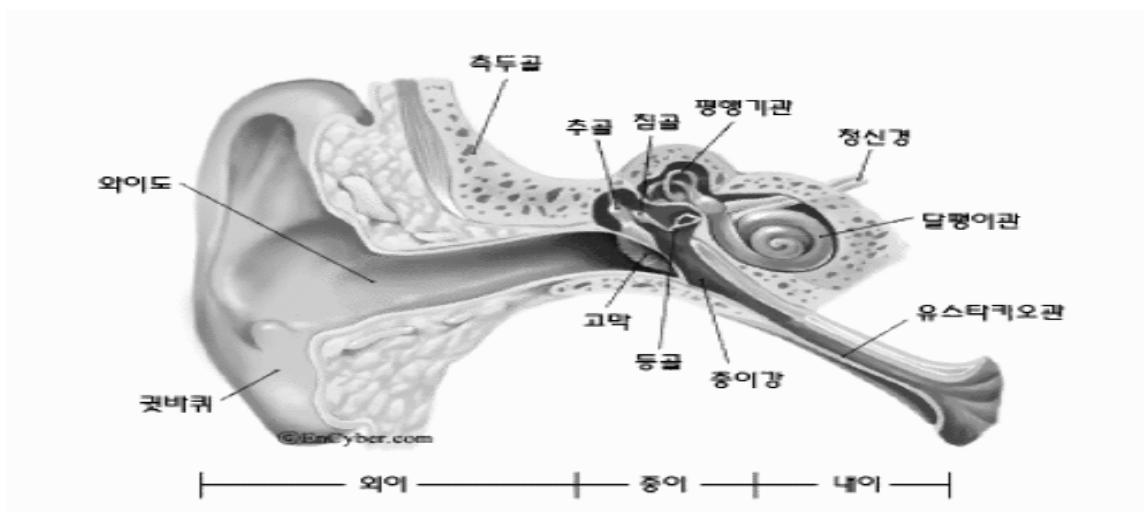
?

활동 1 소리의 높낮이 변화 원리 알아보기

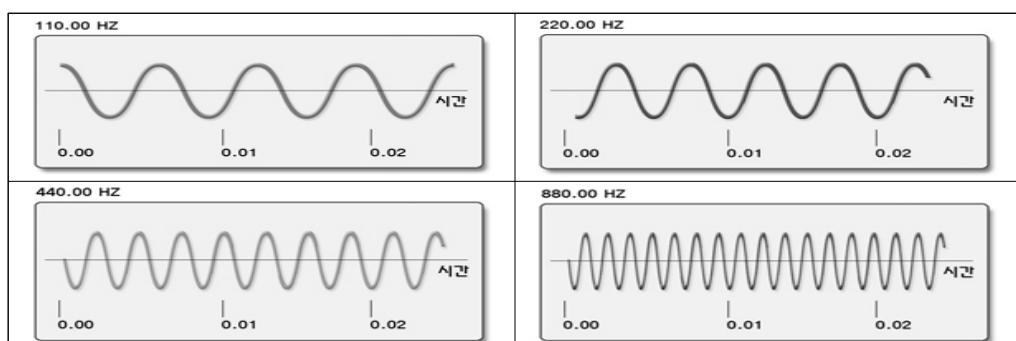
1. ?

가

() 가



가



가

가

가

가

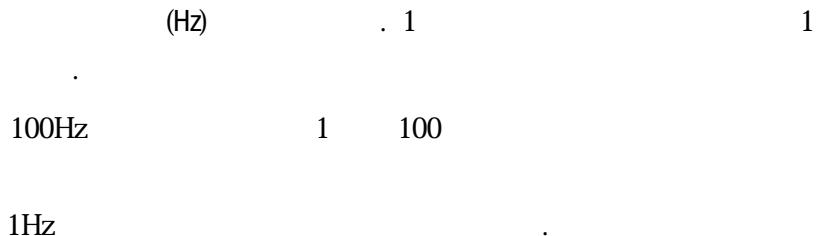
가

()

가

가 !

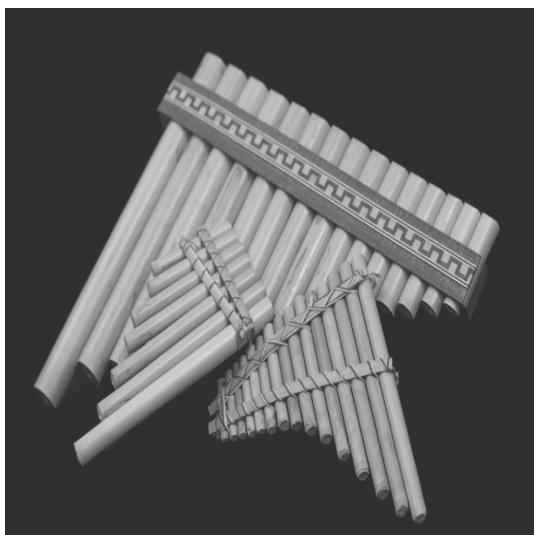
2.



3.

?

	가	가	가	가	가



4.

가 ?

가
가
가
가
가
가
가
가

	가	가	가	가	가	가	가
	10	10	10	20	20	100	(dB)
	가	가	가	가	가	가	가

	16Hz	20000Hz					
	가	.	.	.	.	.	.
	가	가	가	가	가	가	가

	가	가	가	가	가	가	가
	?	?	?	?	?	?	?
	가	가	가	가	가	가	가

	가	가	가	가	가	가	가

활동

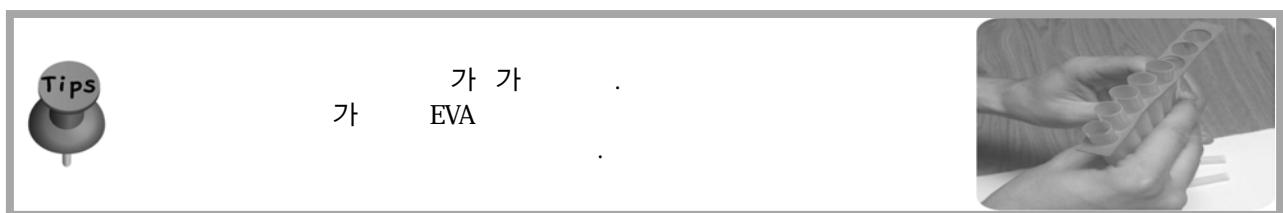
팬플룻을 만들어 보자!

1.

, , , , 가 , , ,

2.

가 , , , , , , , ,



가 가
가 EVA

1cm



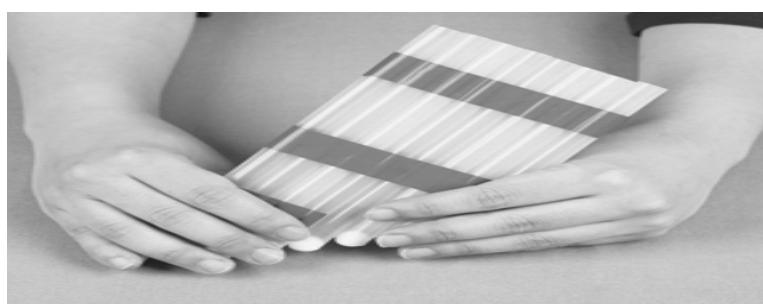
가
가



()



가



가

가

가 !

가

가									2/3
가	5	가							.
,	2/3	,							가
,	,	,							.
1/2	,	,							2
,	,	,							.
									.
									.
									.

(cm)	20	17.8	16	15	13.3	12	10.7	10	
-									
)	,	,	:	20 ×	=13.3333...	13.3			

활동

3

주사기 호루라기를 만들어 보자!

1.

, (10ml), , (), (), (), ()

2.

가. ()



가



가

(

)

가 !



가



가 가

가

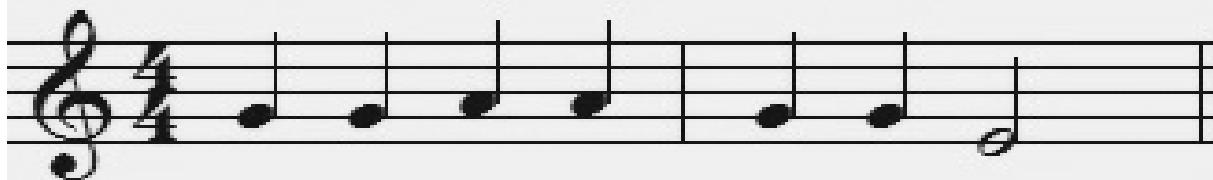
, , , , , ,

: 2018

가



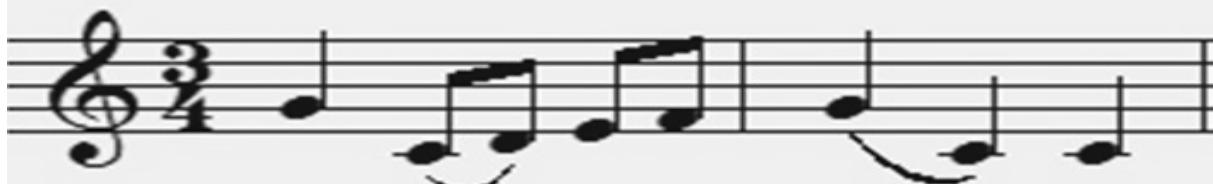
(1)



(2)



(3)



가

가 ?

(가)

1. : 가 ,

2.

가. 가

3.

- , 가 , 가

- 가 가 가 .

가 .
가

가 !

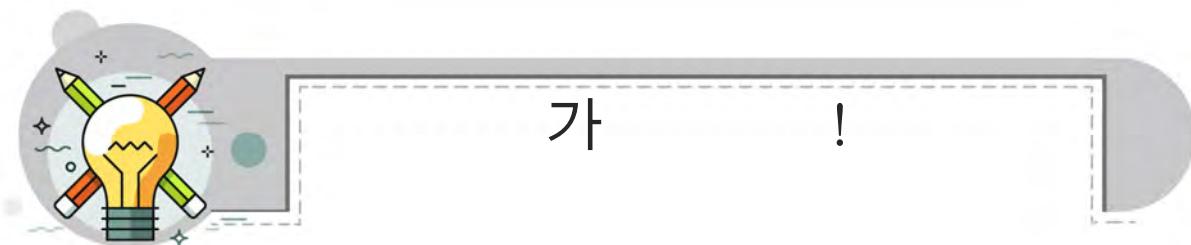
3 2 5.

3 2 4.

가

3

,



가

가

. 3 5

가

가

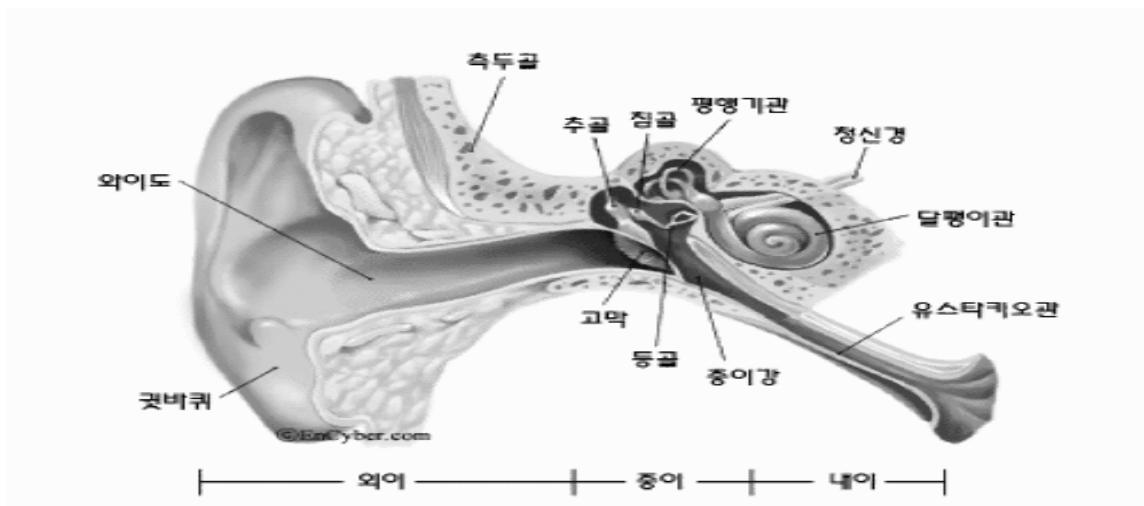
?

활동 1 소리의 높낮이 변화 원리 알아보기

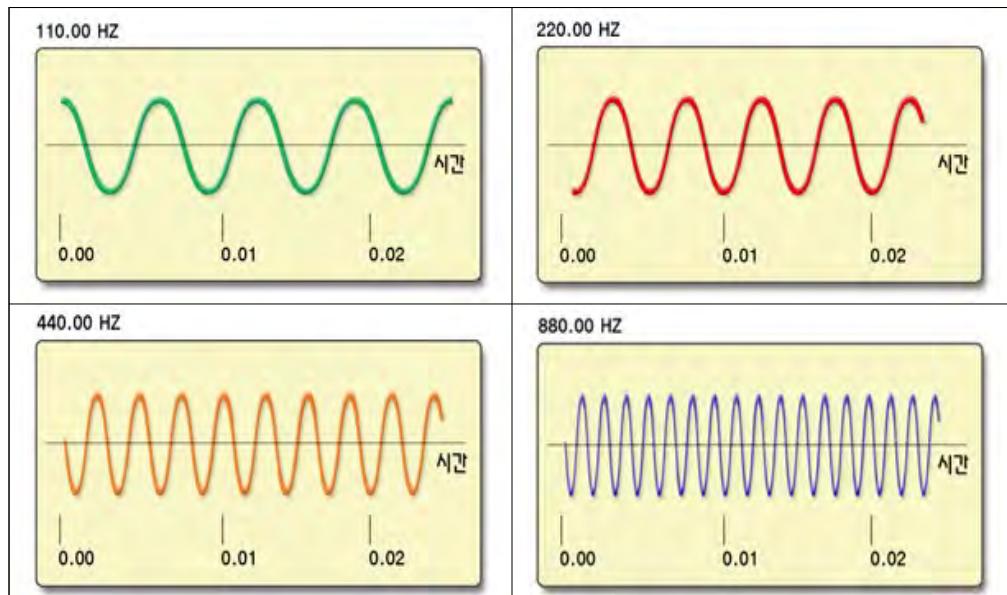
1. ?

가

() 가



가



가

가

가

가

가

()

가

2.

(Hz)

1

1

100Hz

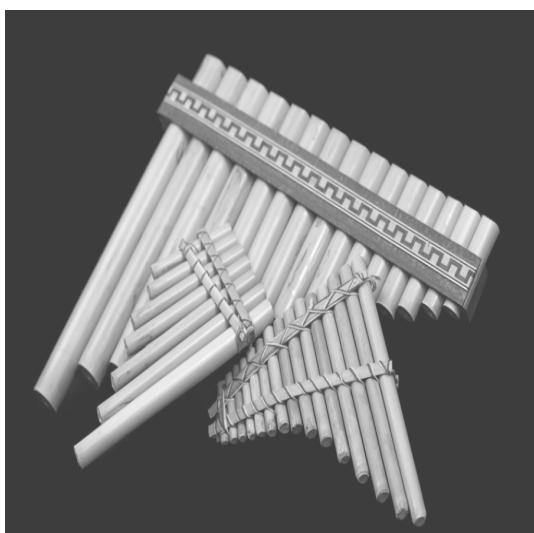
1 100

1Hz

3.

?

	가	가	가	가



4.

가

?

가

가

가

가

가

가

가

가

가

가

	가	,	(dB)
.	10	가	10
.	10	,	20
.	가	,	100
	가	,	가
.	가	,	가
.	가	,	가
.	16Hz	20000Hz	.
.	가	,	가
.	가	,	가
.	가	,	가
.	가	,	가
.	?	가	.
.	가	,	가
.	가	,	가

활동

2

팬플룻을 만들어 보자!

1.

, , , 가 , ,

2.

가 , , , , , , ,

8



1cm



가

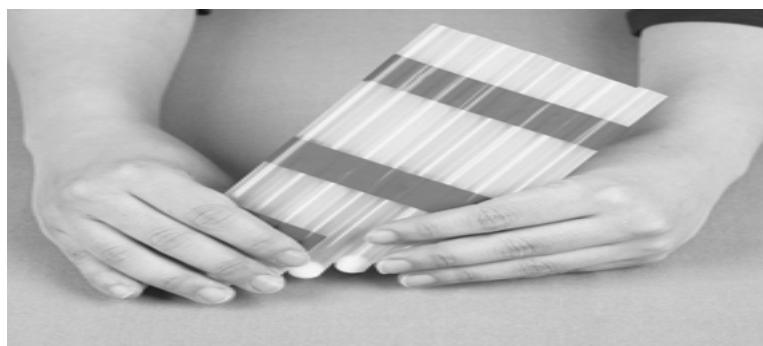
가



()



가



가

가

2/3

가

5

가

,

가 ‘ ’

2/3

,

5

‘ ’

가

1/2

‘ ’

‘ ’

가

2

‘ ’

가 2 가

.

(cm)	20	17.8	16	15	13.3	12	10.7	10	

-) ‘ ’ : $20 \times =13.333\dots$ 13.3

활동

3

주사기 호루라기를 만들어 보자!

1.

, (10ml), , (), (), (), ()

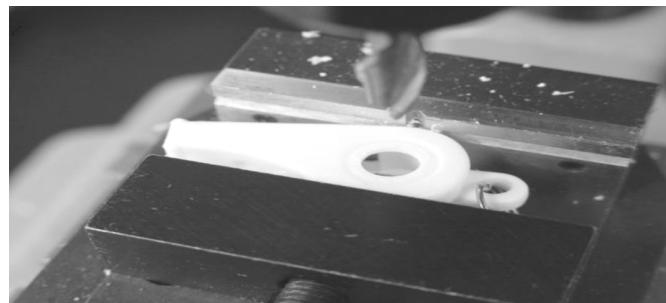
2.

가. ()



가 (), ()





가

, , , , , ,

: 2018

가 !

가

(1)

(2)

(3)

가

가 ?

(가)

1. : 가 ,

2.

가. 가

3.

- , 가 , 가
가 .

- 가 . 가 .

가 .
가 .



	5 : [6 01-05]
	5 : [6 02-02] [6 02-03]
	5 : [6 03-04]

	1.
	2. ,
	3. ,

	1. ‘ ’ ,
	2. ,
	3. ,
	4. Urbanbase()



‘
(untact)
(New Normal)

: 19

가

가

가

가

가



19

7)

가

1.5

?

?

활동

1

나와 내 방에 대해 이해하기

1. ‘ ’ ?



‘ ’ ? 가

8)

7) <https://pixabay.com/ko/images/id-2956971/>

8) <https://pixabay.com/ko/images/id-4621049/>

, , 가 ‘ ’ 가 .
, 가 ?

2.

가
가 , 가 , 가 ,
,

활동 2 내 방의 문제점 인식하기

1. 1 - (ALU)

ALU
ALU 가 , A(advantage, /
, L(limitation, /), U(unique qualities,)

	9)
	10)
	가
	가
	11)
	12)
	가

9) <https://pixabay.com/ko/images/id--2974356/>

10) <https://www.flickr.com/photos/166111585@N05/42063653140/>

11) https://www.flickr.com/search/groups/?text=3135102401_9ea547734b_o

12) <https://pixabay.com/ko/images/id-4508017/>

2.

2 -

(PMI)

(Plus)

(Minus),

(Interesting)

()			
	(P)	가	
	(M)		
	(I)		

활동

3

미래의 내 방 구상하기

1.

가	가 가

13) <https://pixabay.com/ko/images/id-2132349/>



가

1¹⁴⁾



가

2¹⁵⁾

2.

	?
가	,
	가
	?
	가
	?
- 가	

14) <https://pixabay.com/ko/images/id-2974350/>

15) <https://pixabay.com/ko/images/id-4508290/>

3.

가

가

가

(: ‘ / / / ’ .)

()

	- 가 - 가 -
가 (가)	- 가 : , , , , TV - 가 : TV, , , -
(+)	- : - 가 : -
가	- TV , TV - -
()	- 가 - , , TV - : - 1 , 1

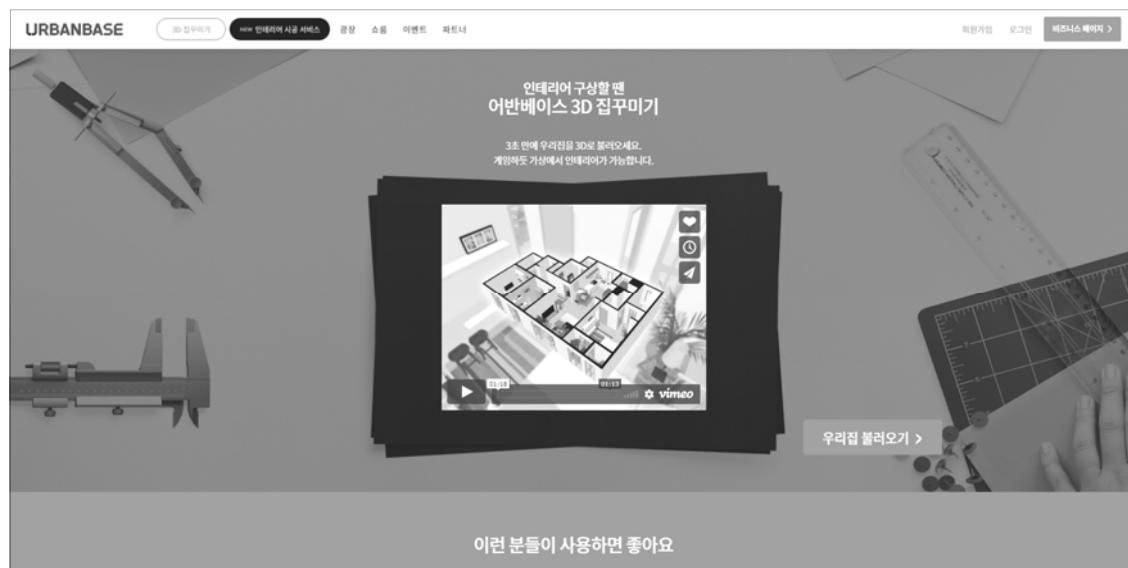
활동

4

미래의 내 방 설계하기

(urbanbase)

가
가
가
가



16)

1. (urbanbase) 가

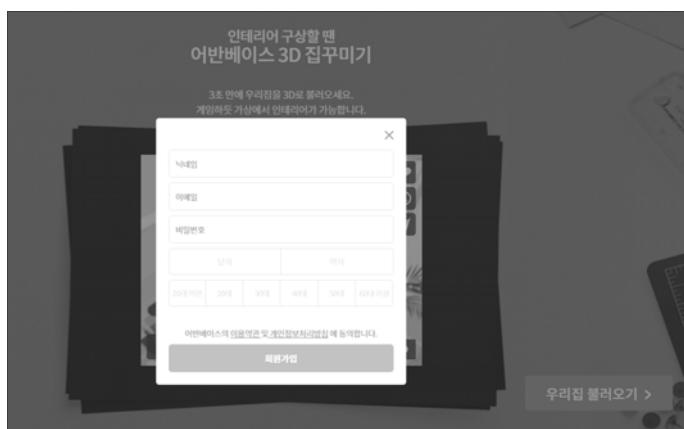
(<https://urbanbase.com/>)

가

가

가

가



가

17)

16) <https://urbanbase.com/>

17) <https://urbanbase.com/>

2. (urbanbase)

가

- [

] - [

가

]

.



. 가

: [

] - [가

] - [.()

1) 가

가

.(

)

2) 가

,

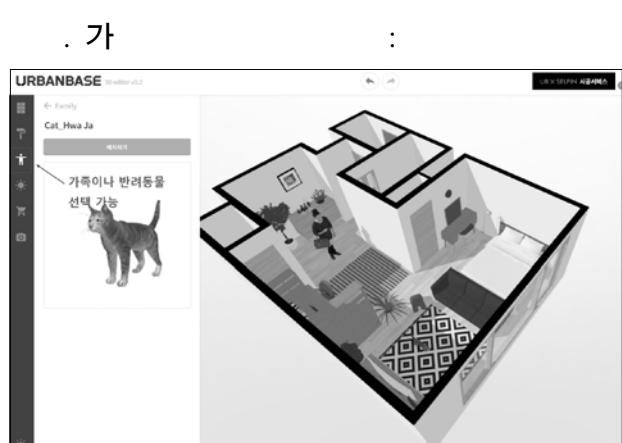
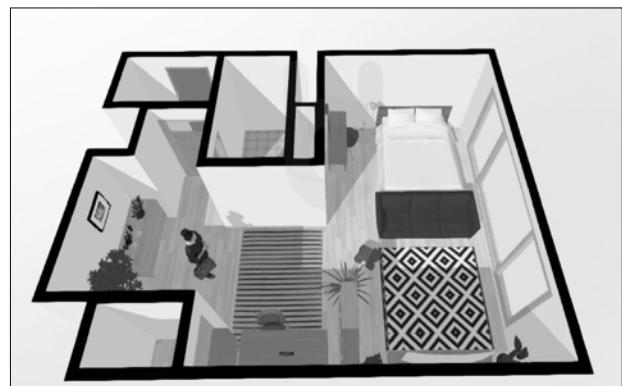
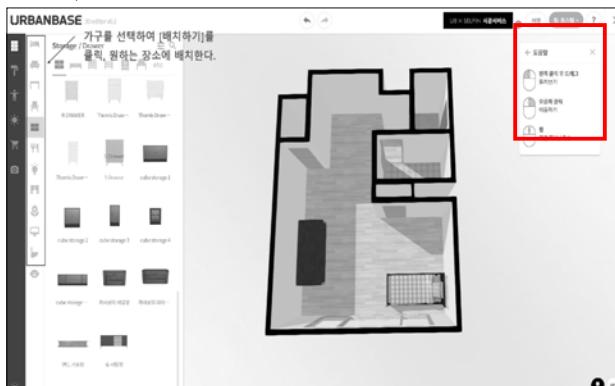
3) 가

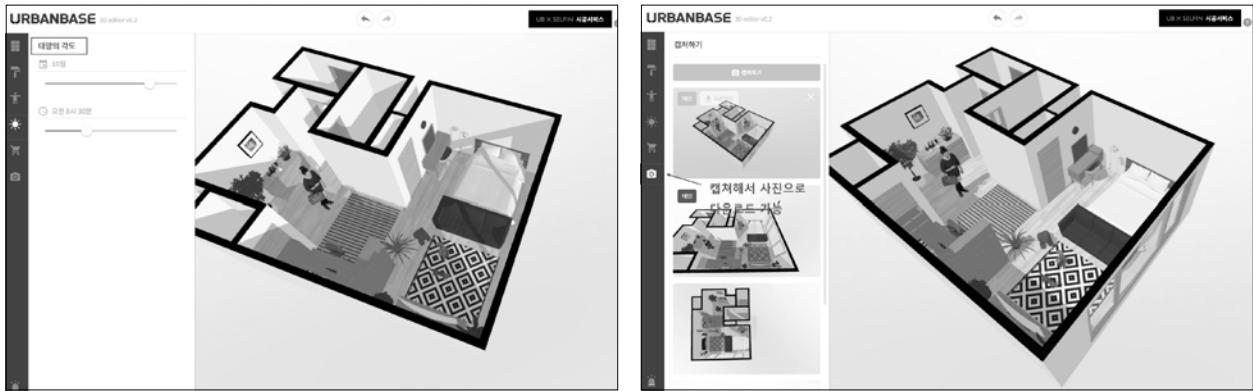
가

4) 가

, , 가

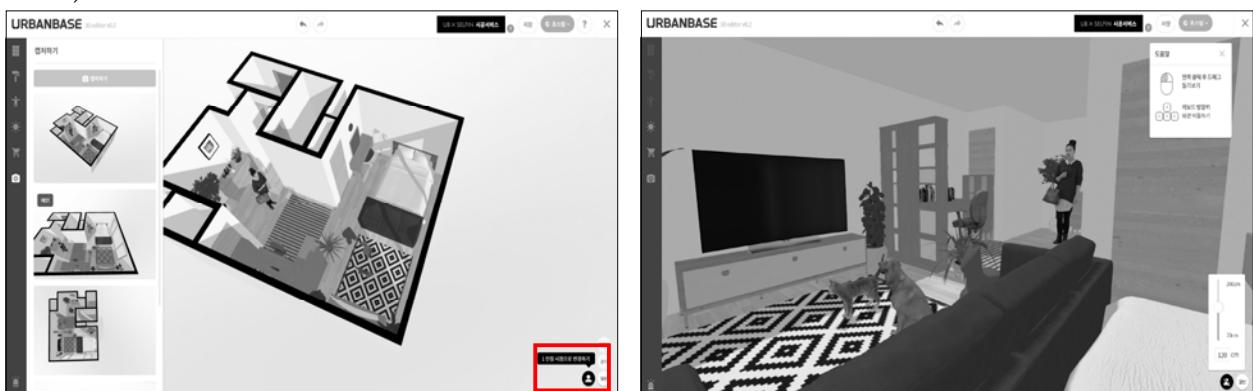
, , 가 가



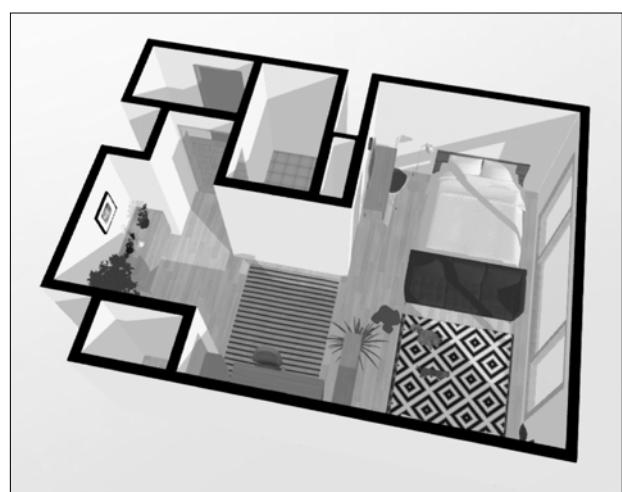
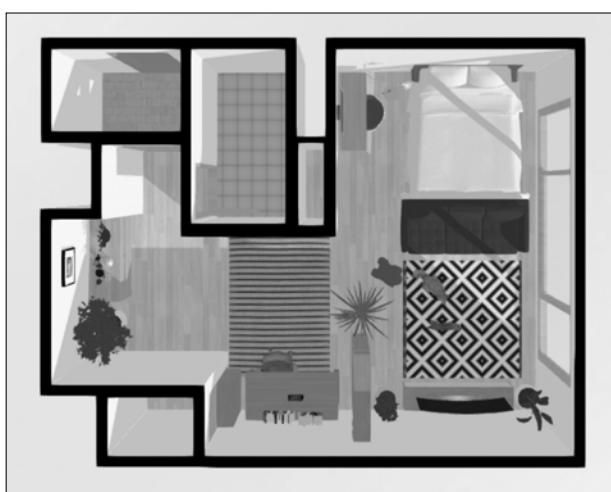


1) 가 가 (VR)

2)



! : [] !



' , [] '

< > ALU (Adavantage, Limitation and Unique Qualities)

1. ALU ?

(advantage), (limitation), (unique qualities)
가 , 가 , 가
가 ,

2. 가 4가

3. 가 가

4.

. PMI P

ALU 가 , ,
가 . PMI M

가 . “ 가
가? ” .

. ALU

:	가 가	'	,	'	,	'	,	'
:	가 가	'	,	'	,	가(	..)?	가
:	가 가							

5. ALU ()

2

가

	2	.	.	.	.	.
(A)		.	.	.	.	.
(L)	2	.	.	가	.	.
(U)	1 2	.	.	.	.	.

: ()

5 1 3. ()

가 , 1 가 가

5, 6

5

,



(untact) 19

(New Normal)

가

가

가

가

19

1.5

?

?



18)

18) <https://pixabay.com/ko/images/id-2956971/>

활동

1

나와 내 방에 대해 이해하기

1. ‘ ’ ?

‘ ’ ? 가 ‘ ’ , ‘ ’ , ‘ ’ , ‘ ’ ,
가 ‘ ’ , ‘ ’ , ‘ ’ , ?



19)

2.

‘ ’ , ‘ ’ , ‘ ’ ,
‘ ’ , ‘ ’ , ‘ ’ , ‘ ’ ,
,

19) <https://pixabay.com/ko/images/id-4621049/>

가

가

, 가

, 가

가

, 가 , 가

, , ,

, , , ,

‘ ’	‘ ’
,	.()

활동 2 내 방의 문제점 인식하기

1. 1 - (ALU)

ALU 가 ,
ALU 가 , A(advantage, /
, L(limitation, /), U(unique qualities,)

	20)
	21)
	22)
	23)

20) <https://pixabay.com/ko/images/id--2974356/>

21) <https://www.flickr.com/photos/166111585@N05/42063653140/>

22) https://www.flickr.com/search/groups/?text=3135102401_9ea547734b_o

23) <https://pixabay.com/ko/images/id-4508017/>

2.

2 -

(PMI)

(Plus)

(Minus),

(Interesting)

()		
	(P)	
	(M)	
	(I)	

활동

3

미래의 내 방 구상하기

1.

가	



가

1²⁴⁾



가

2²⁵⁾

2.

-

	?
	, ?
	?
	가 ?

24) <https://pixabay.com/ko/images/id-2974350/>

25) <https://pixabay.com/ko/images/id-4508290/>

3.

가

가

가

(: ‘ / / / ’ .)

()

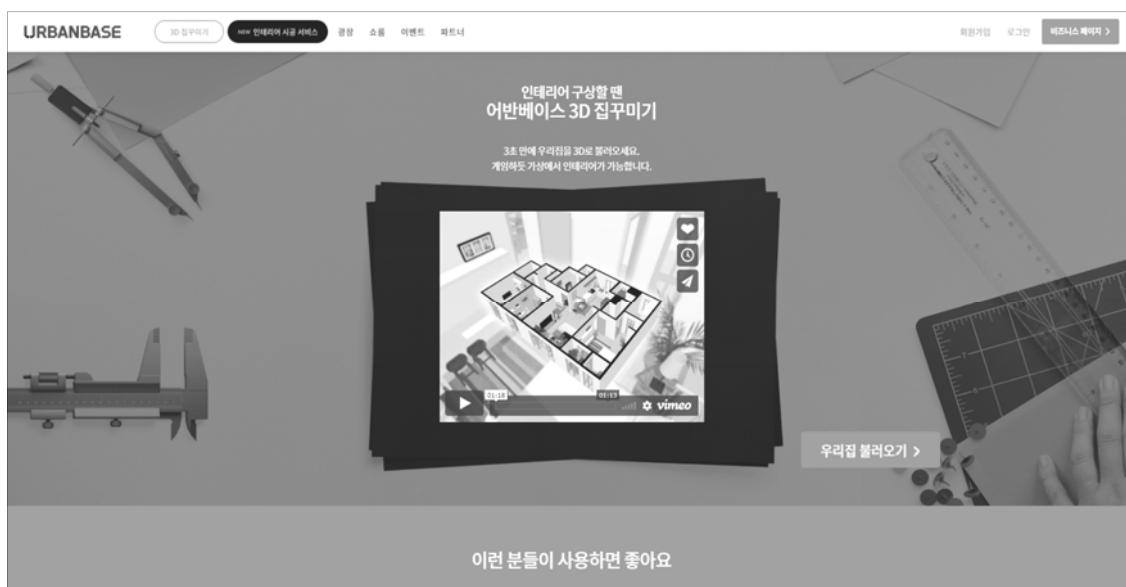
가 (가)	
(+)	
가	
()	

활동 4

미래의 내 방 설계하기

(urbanbase)

가 가
가 ,
가 ,
가



26)

1. (urbanbase) 가



(<https://urbanbase.com>)

가
가
가
가

27)

26) <https://urbanbase.com/>
27) <https://urbanbase.com/>

2. (urbanbase)

가. []-[]-[]
가.



. 가 : []-[]-[]

1) 가 .()

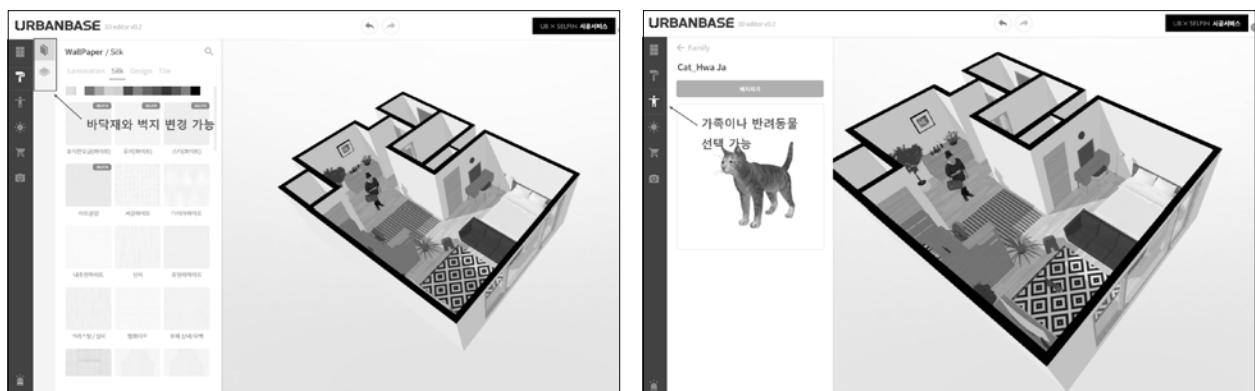
2) 가 ,

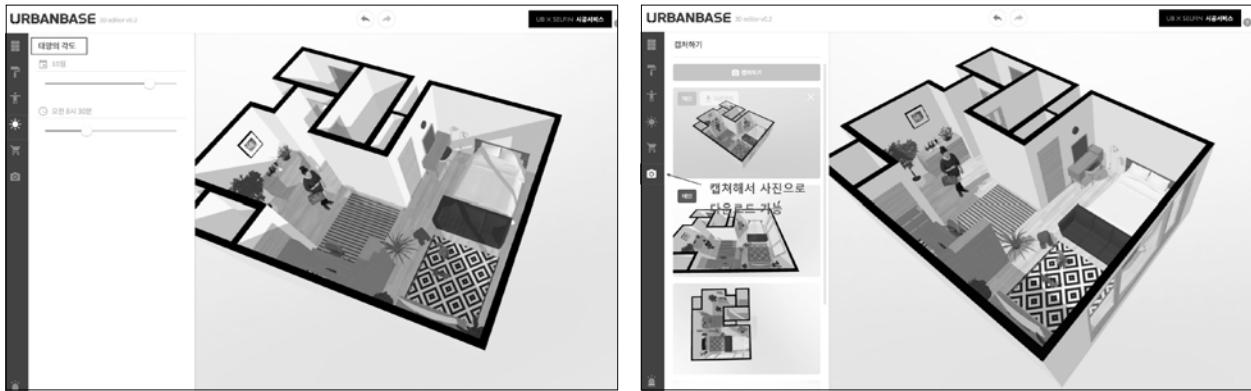
3) 가 .

4) 가 , , 가 .

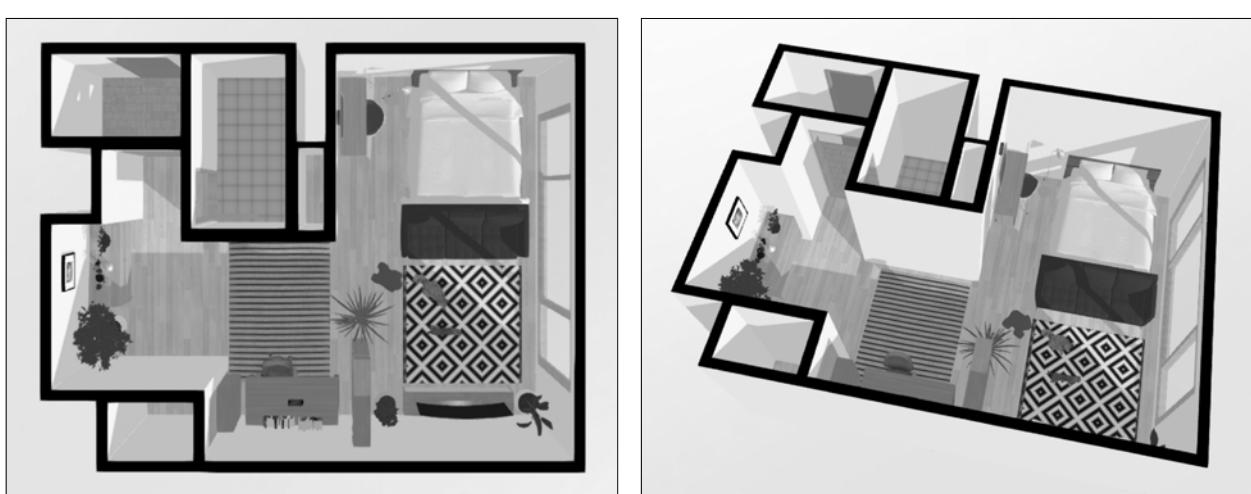
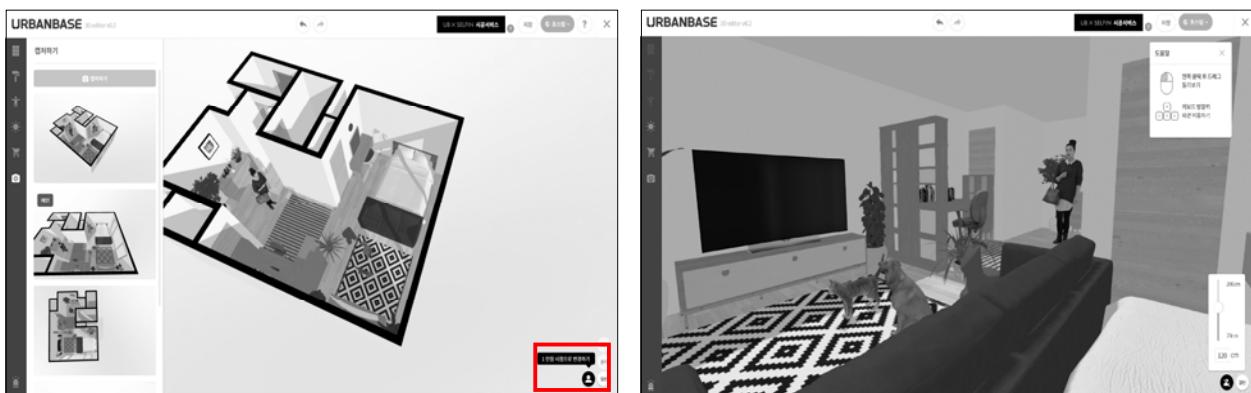


: . 가 :





1) 가 가 (VR)
2)



: ()



3 : [4 01-02]

[4 01-05]

3 : [4 01-02]

5-6 : [6 02-04]

6 : [6 05-06]

1.

2.

3.

가

4.

5.

가

1.

2.

3.



50

?

, , 가 SF

?
가
가



(: LG , <https://www.flickr.com/photos/lge/38085571355>)

활동 1 오조봇에 대해 알기

1.

가.

LED 5 가

가

, , , , ,

가

(OzoBlockly)

3.0

가

가

2.0

LED

가

2.0

(OzoBlockly)

2014

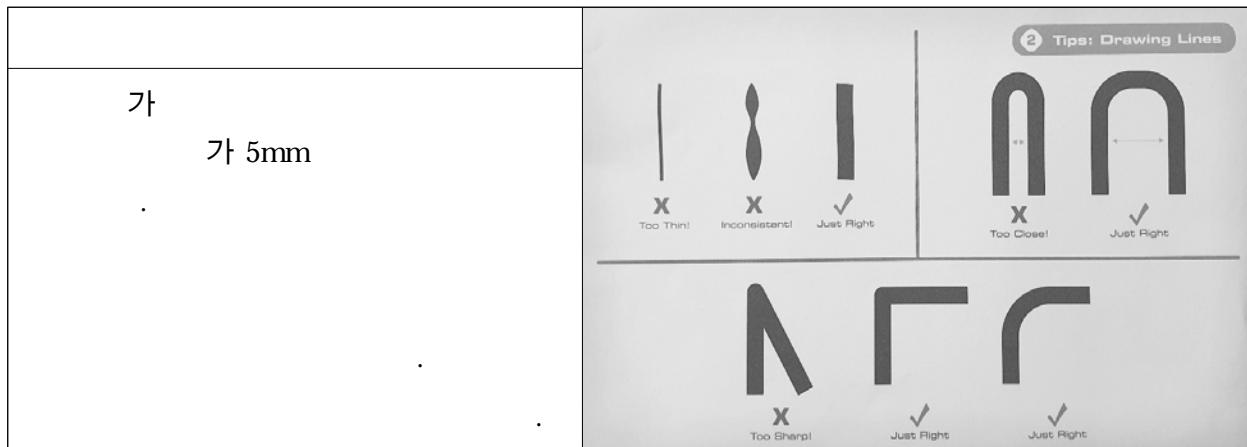
CEO

(Nader Hamda)가

?

가

1) 5mm



2)

3)

4)

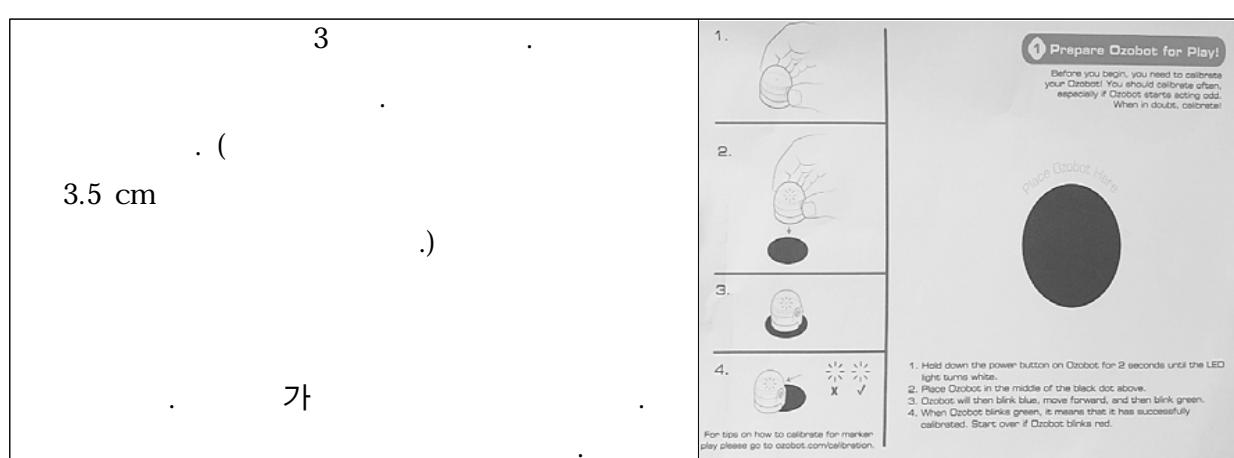
LED

1) ?

2)

3
.)
3.5 cm

가



2. ?

가.

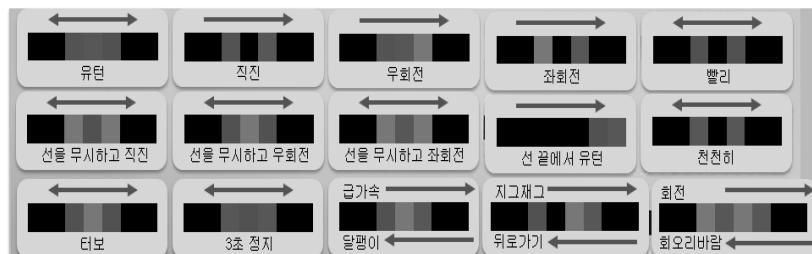
, , , , 가
가
,

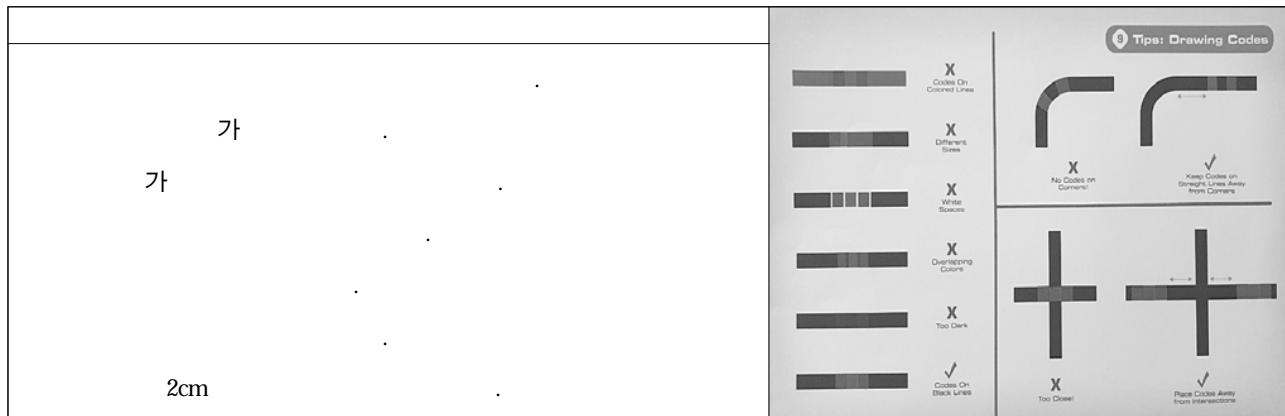
가
가
가

1) - , , 가 ,

2) - , , , , ,
,

3) : , , 가 , , , 3





[.\(http://clevermate.kr/contents/list.html?category=2\)](http://clevermate.kr/contents/list.html?category=2)

활동 2 오조봇 자율주행차 만들기

1.

가

가.

1)

가

2)

가

가 가

가

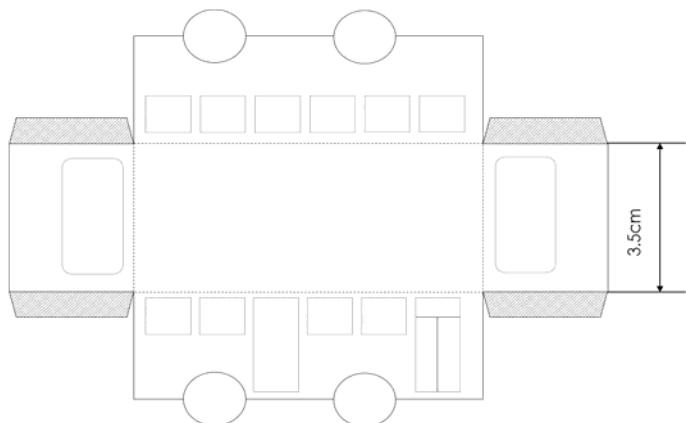
가

가 가
가

가

2.

가. - (2.0), , , , , 가 , ,

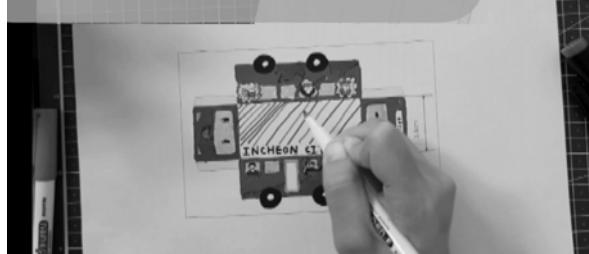


(www.finalpaper.net), Canon Creative Park (cp.c-ij.com)

1. 준비하기



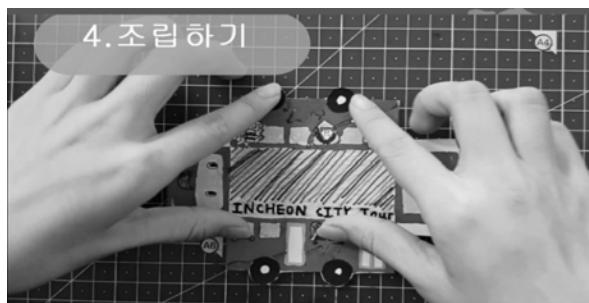
2. 자동차 색칠하기



3. 자동차 오리기



4. 조립하기



5. 오조봇 연결하기

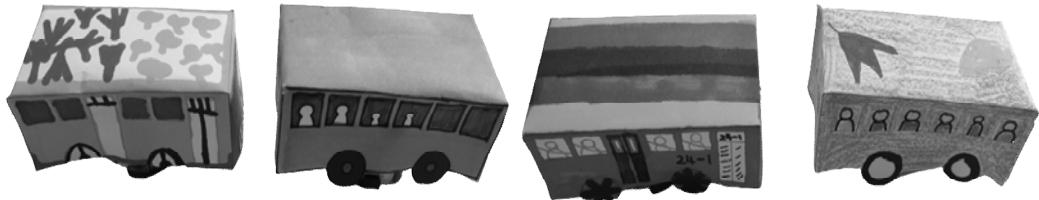


완성~!





가



활동

3

오조봇 자율주행차로 우리고장 운행하기

1.

, 가 , , ,

2.

가.

1)

2)

- <http://map.ngii.go.kr> , ‘ ’ , ‘ ’ , ‘ ’

3)

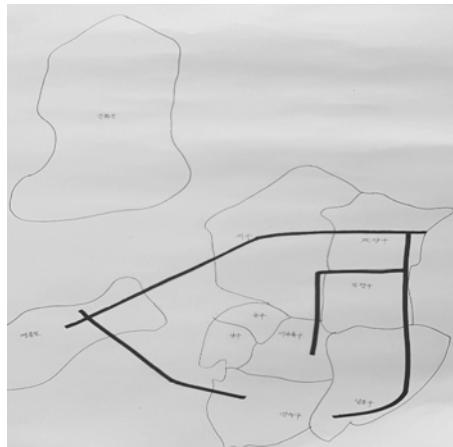
가

4)

가 , 가 ()



. 가



()

1	- - - - -
2	- - - - -
3	- - - - -
4	** ()- () - ()- - kpop

1)

-
-
-

가

2)

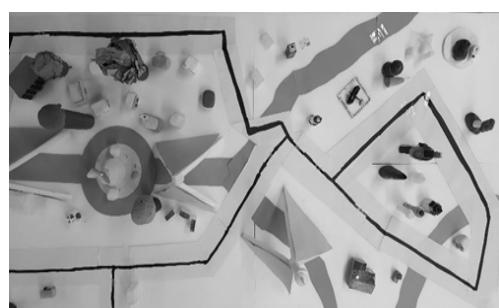
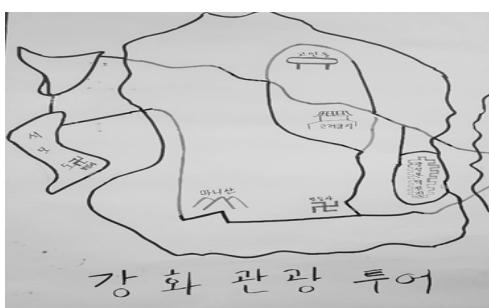
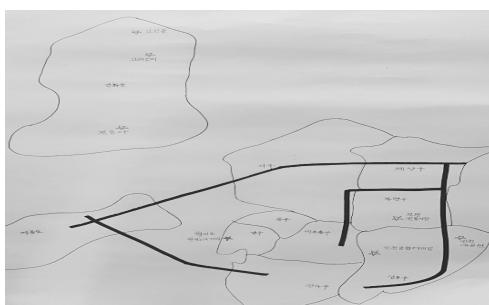
1	*	kpop

1)

2)

3)

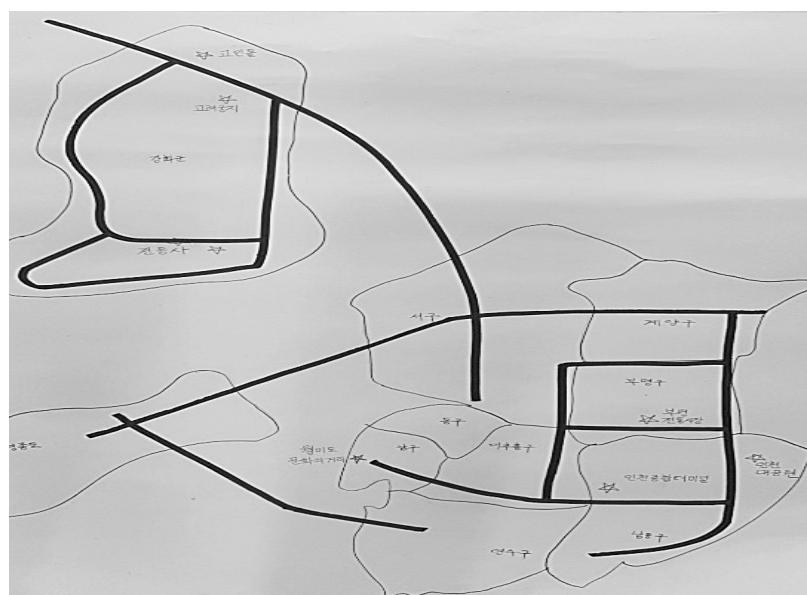
(,)



가

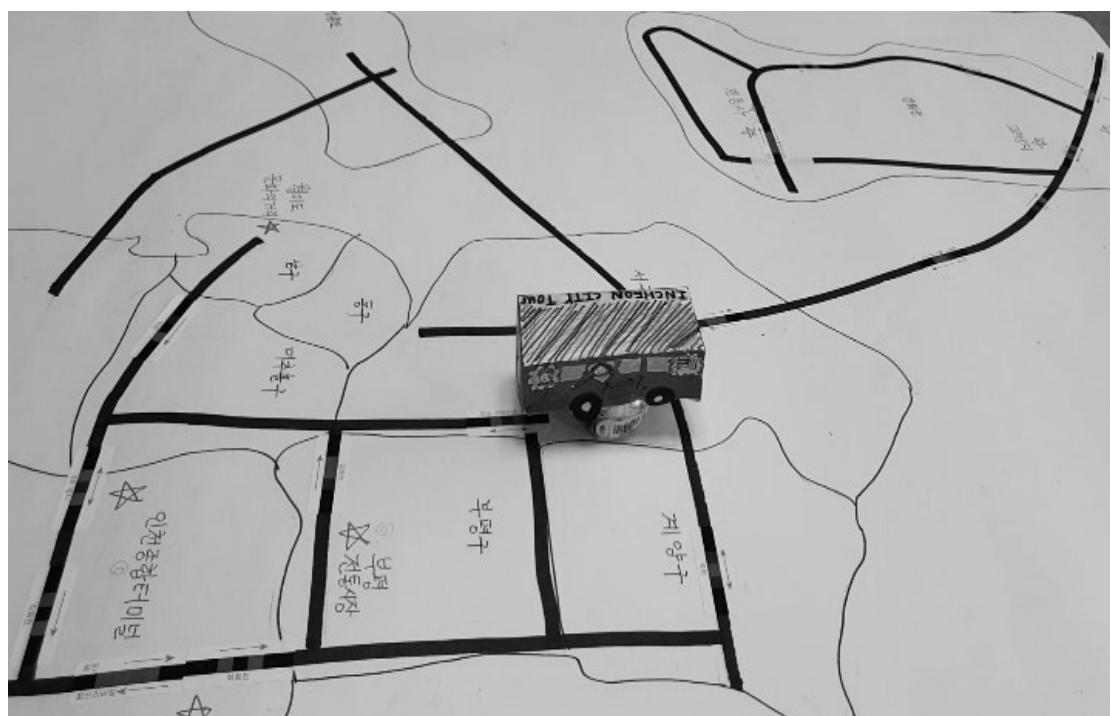
가

가



가 ()

가



3 : 1.

()

3

5-6

가

6

<활동지 자료- 백지도>





50

?

, , , ,
,

가

SF

?

가

가
가



(: LG , <https://www.flickr.com/photos/lge/38085571355>)

활동 1 오조봇에 대해 알기

1.

가.

LED 5

가

가

, , , , ,

, , ,

가

2014

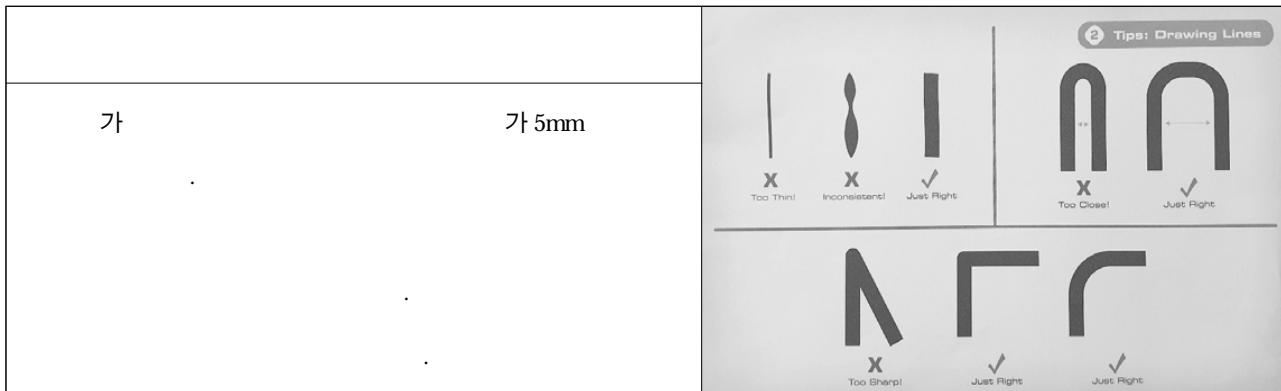
CEO

(Nader Hamda)†

?

†

1) 5mm



2)

3)

4)

LED

1)

?

2)

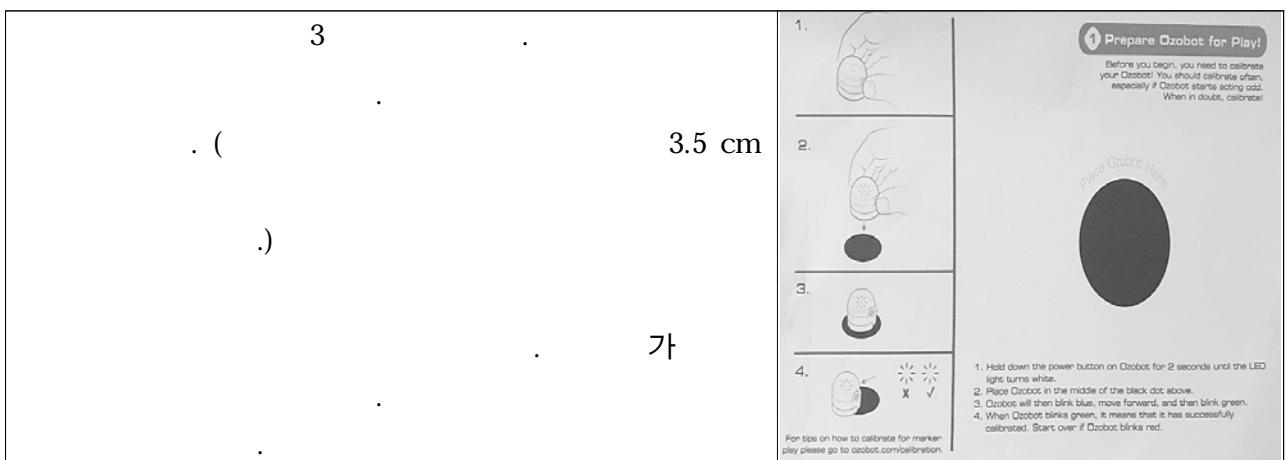
3

(

3.5 cm

.)

가



2. ?

가.

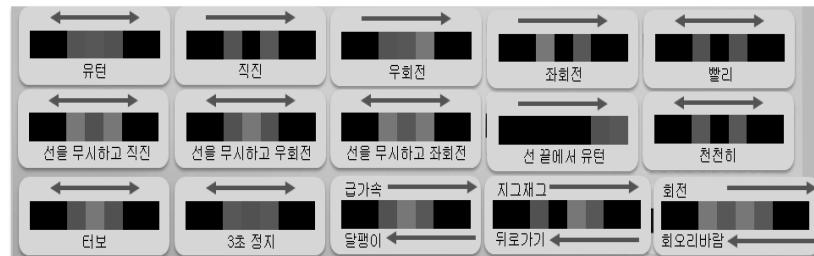
, , , 가
가
,

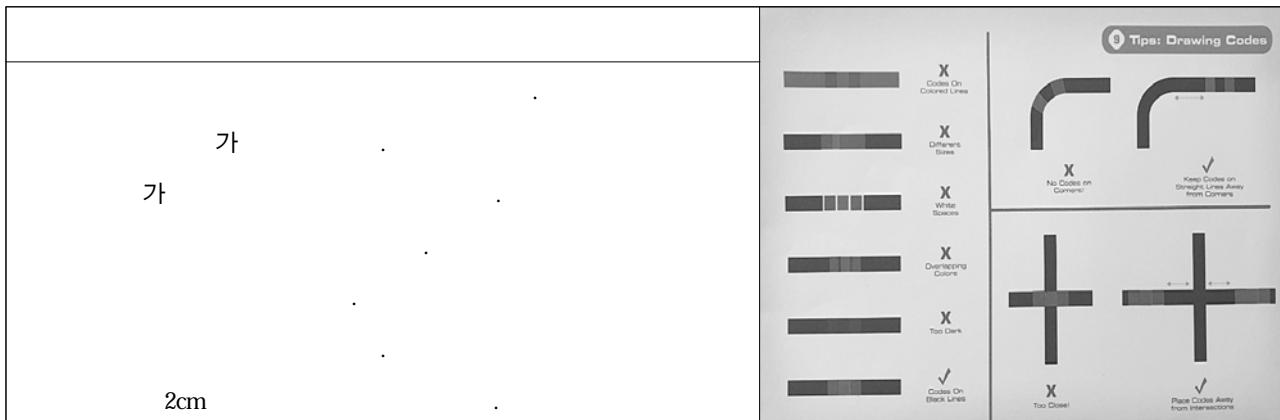
가
가
가

1) - , , 가 ,

2) - , , , , , , ,

3) : , , 가 , , , 3





(<http://clevermate.kr/contents/list.html?category=2>)

활동 2 오조봇 자율주행차 만들기

1.

가

가

1)

:

가

, , , ,

2)

:

가 , , ,

가

가 가

가

가

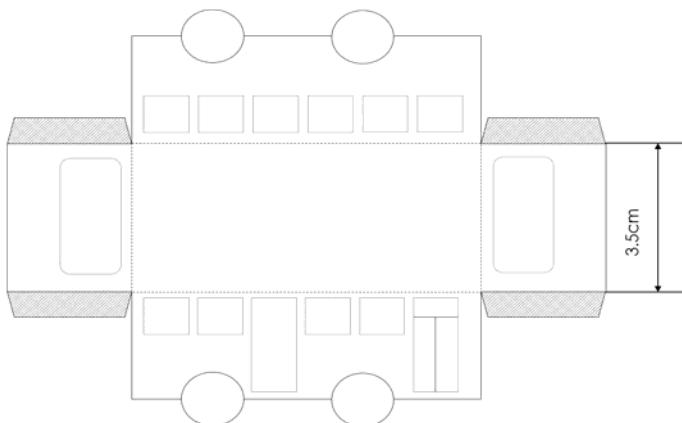
가 가

가

가

2.

가. - (2.0), , , , , 가 , ,



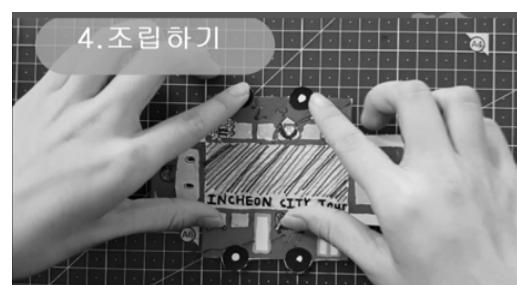
3cm

3.5cm,

가 5-6cm 가

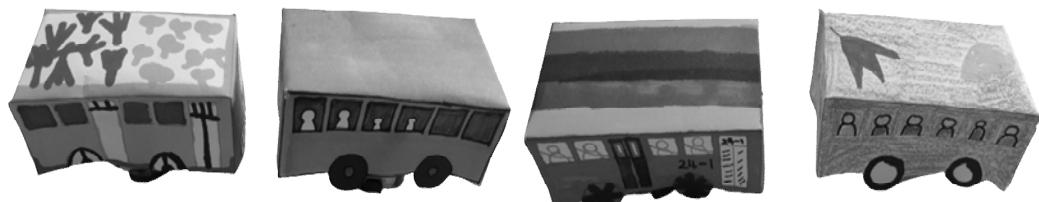


(www.finalpaper.net), Canon Creative Park (cp.c-ij.com)





가



활동

3

오조봇 자율주행차로 우리고장 운행하기

1.

, 가 , ,

2.

가.

1)

2)

- <http://map.ngii.go.kr> - ‘ ’ ‘ ’ ‘ ’

3)

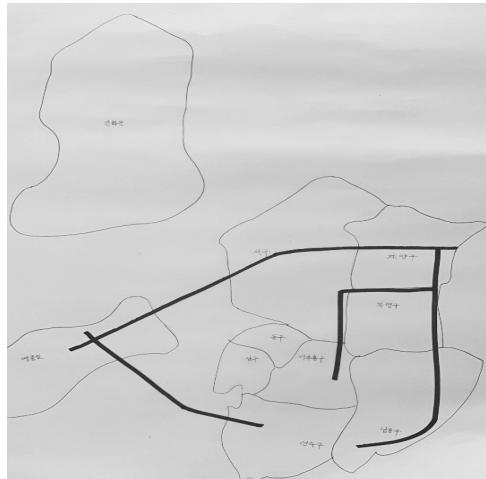
가

4)

가 , 가 ()



. 가



()

1	- - - - -
2	- - - - -
3	- - - - -
4	()- () - ()- - kpop **

1)

- - -

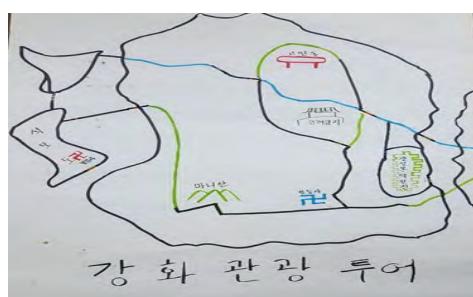
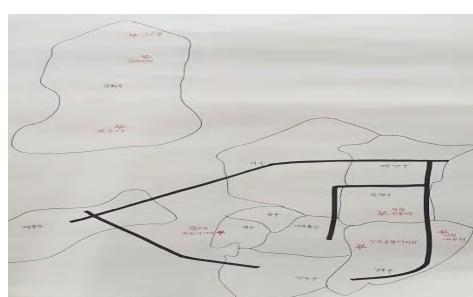
가

2)

1)

2)

3)

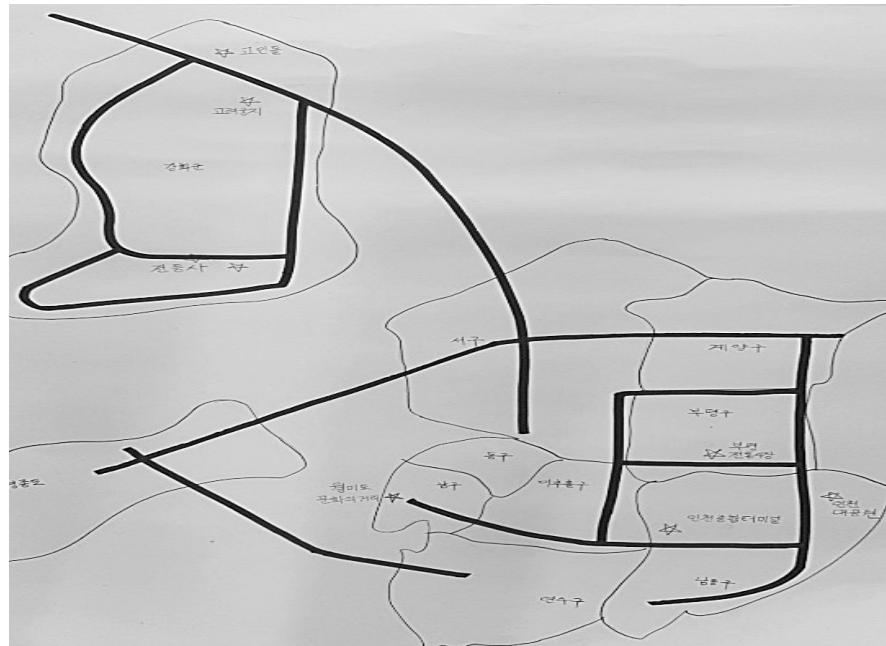


가

가

가

가



가

가



()
가

가

!

가

)



가

(

)

가



<활동지 자료- 백지도>





3 : [4 02-03]

3 : [4 02-02]

[4 02-03] ,

6 : [6 05-03]

1.

2.

3.

1.

2.

3.

(&)



가

?

가

가

활동**1****발명과 발견 이해하기**

1.

- , , - , - , - DNA -	- - - -

2.

가 , 가

,

,

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,

,

,



[]

X- ! ? ?

<https://www.youtube.com/watch?v=gsEj3KMLfmk>

3.

lodestone

(Fe O)

(magnet)

(loadstone

.

가

‘

(magnesia)

‘

(magnes) ’

가



[]

<https://www.youtube.com/watch?v=q29t960HOY4>

4.

220

28)

가
引針)' (司南)

(25 220)
(杓)'

(王充) < (論衡)>

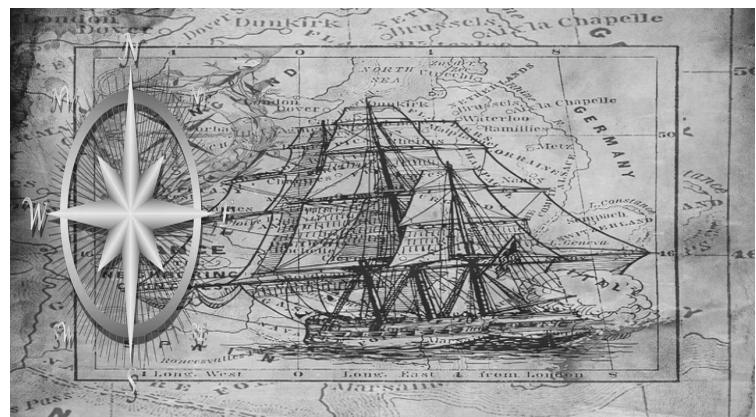
(慈石

가
1000

14



29)



30)

5.

가

1200

가

(electricity)

‘ ’ []

‘ ’ /ytn

<https://www.youtube.com/watch?v=AChrdns-BfM>

28) <https://terms.naver.com/entry.nhn?cid=43667&docId=66822&categoryId=43667>
(, pmg)

29) <https://pixabay.com/images/id-2528477>

30) https://cdn.pixabay.com/photo/2015/11/08/17/10/banner-1033933_1280.jpg

활동

2

자석을 이용한 다양한 발명품 알아보기

: , ,

: , , , , , , ,

[]

()

 <https://www.youtube.com/watch?v=B5A42hzn3g4>

() https://www.youtube.com/watch?v=Ev_eymxBnUE

() https://www.youtube.com/watch?v=lwOzLBWuD_0

가

[]

() <https://www.youtube.com/watch?v=3ChmdMWQS5U>

() <https://www.youtube.com/watch?v=Y6edB5l6ygU>

() 가 () <https://www.youtube.com/watch?v=GckO6SQ1LFo>

() <https://www.youtube.com/watch?v=3DdowgqUfTs>

() <https://www.youtube.com/watch?v=HZd48D5Wu40>

() <https://www.youtube.com/watch?v=eFtZaNrbXwc>

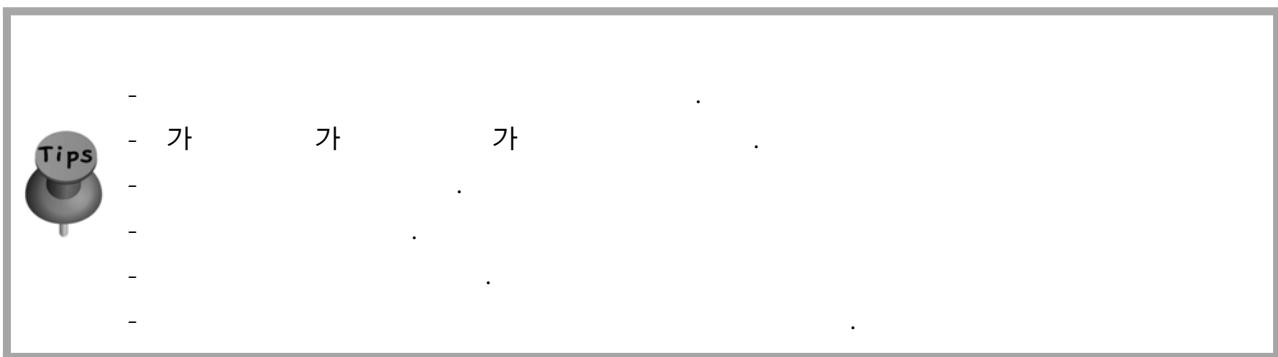
() <https://www.youtube.com/watch?v=aRflg8W-c5w>

() https://www.youtube.com/watch?v=wG_-BMy4Xfw

활동 3 자석을 이용한 나만의 발명품 구상하기

1.

가



2.

가

+

ex)

Rsp

가

4

4

?

brain() + storming() = brainstorming

가



(.) (.) (.) (.)

idea			
	()	()	()
		Rsp	
	<p>1.</p> <p>2.</p> <p>3.</p>		

3.

가

가

A + A	=	+
A + B	=	+
B + B	=	+ 가 + +

()

+ =

()

?

=>

()

()

가

()

()

가

()
가
가

4가
가

가

가

가

()

가

가

가



- 10 : playstore ‘ ’
- : < 10 >
- 3 가 : , , ,

4. PMI

PMI		
Plus	Minus	Interesting
가	가	

PMI

가

PMI (Plus- Minus -Intereting)



PMI

()

3

1

4.

3

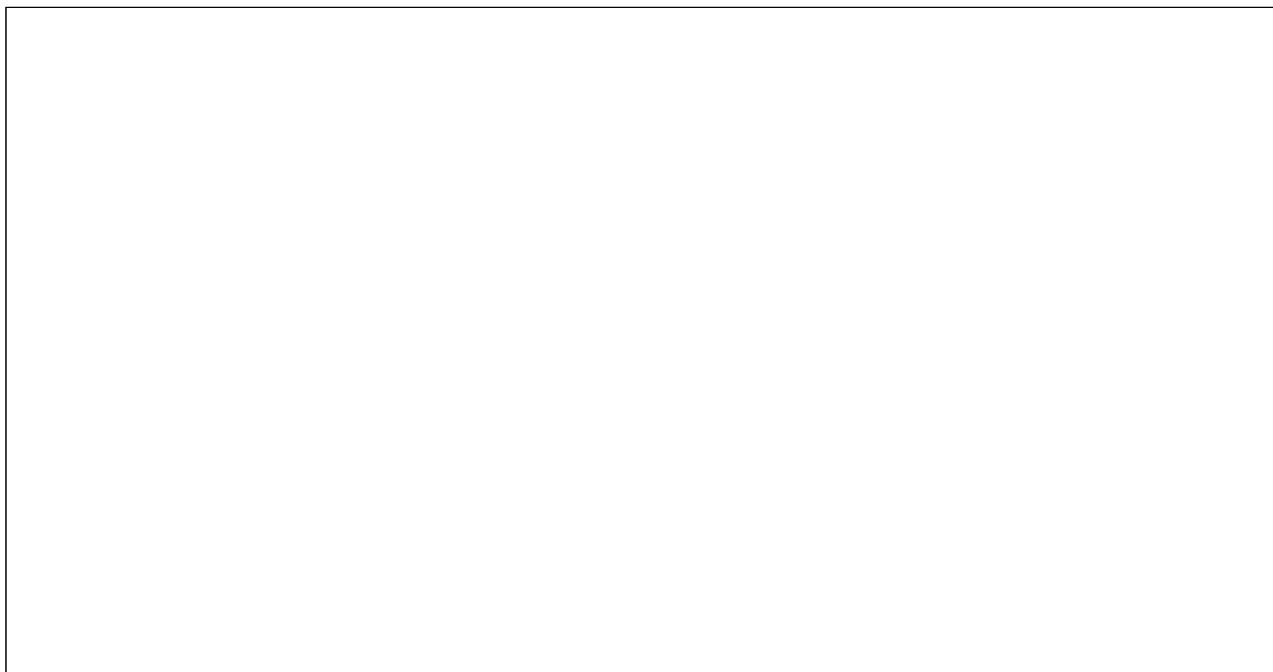
6

PMI

,

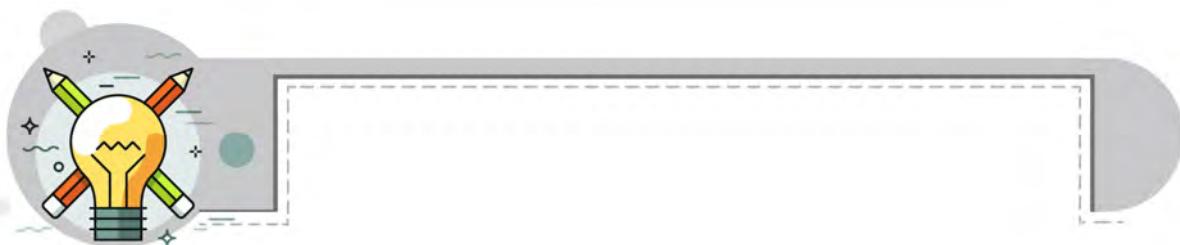
P	,	
M	,	
I		

< >



자석을 이용한 나만의 발명품

()	
가	
()	



가

?

,

,

가

가

활동 1 발명과 발견 이해하기

1.

2.

가 , 가

3.

(marget)

(loadstone

lodestone)

(Fe O)

가

(magnesia)

(magnes) '

가

4.

220

.31)

가

(25 220)

(王充)

(論衡)>

(慈石

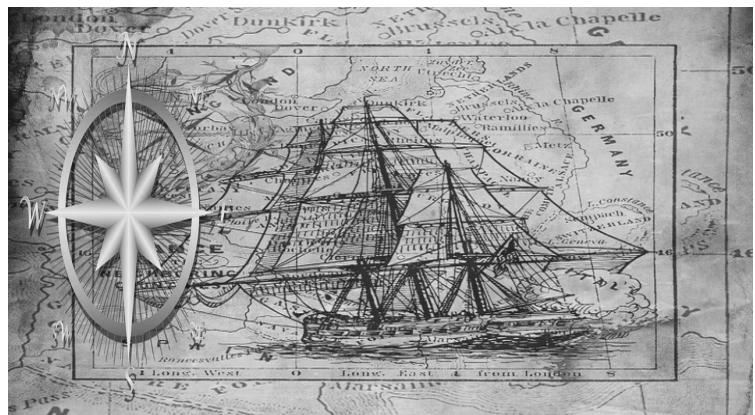
31

1000

14



32)



33)

31) <https://terms.naver.com/entry.nhn?cid=43667&docId=66822&categoryId=43667>
(, png)

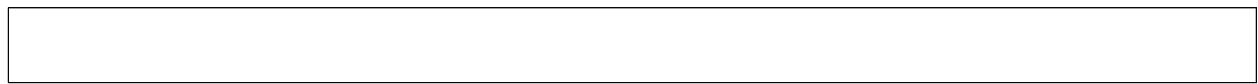
32) <https://pixabay.com/images/id-2528477>

33) https://cdn.pixabay.com/photo/2015/11/08/17/10/banner-1033933_1280.jpg

활동

2

자석을 이용한 다양한 발명품



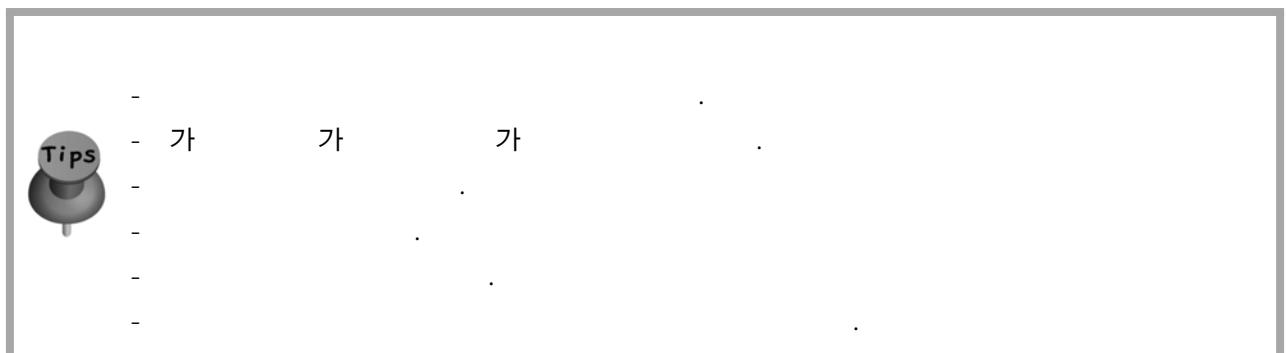
활동

3

자석을 이용한 나만의 발명품 구상하기

1.

가



2.

가

ex)

+

•

Rsp

가

4

4

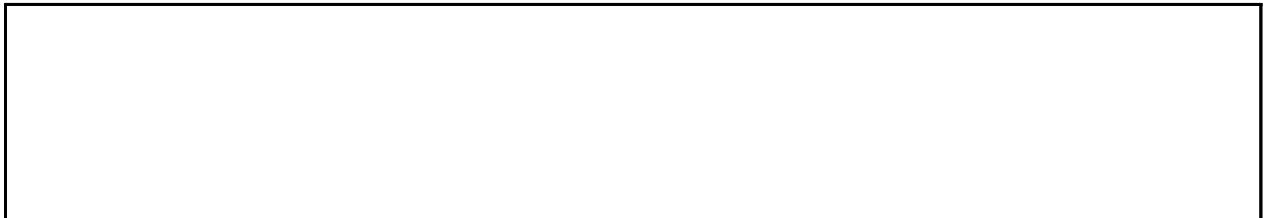
3.

가

가



, , , ,



4가
가

Figure 1. The effect of the number of clusters on the classification accuracy of the proposed model. The proposed model is compared with the K-Means clustering algorithm.

가 가

Figure 1. The effect of the number of clusters on the classification accuracy.

가

“ ” “ ” . 가 . 가

4. PMI

PMI		
Plus	Minus	Interesting
가	가	

PMI

가

PMI

,

P	,	
M	,	
I		

<

>

--

자석을 이용한 나만의 발명품

()	
가	
()	



LED

6 : [6 05-06]

[6 05-04]

6 : [6 13-01]

1.

2.

3.

1. 가

2.

3.



? ? ? ? 3D ?

활동

1

가변저항으로 빛의 밝기 조절하기

1. 가

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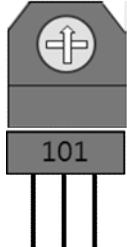
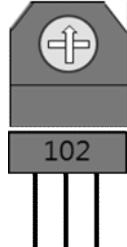
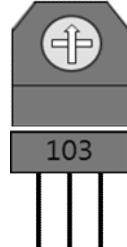
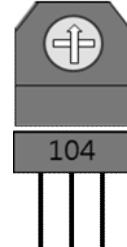
'

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	101	102	103	104
				
()	0~100	0~1,000 (0~1k)	0~10,000 (0~10k)	0~100,000 (0~100k)

가

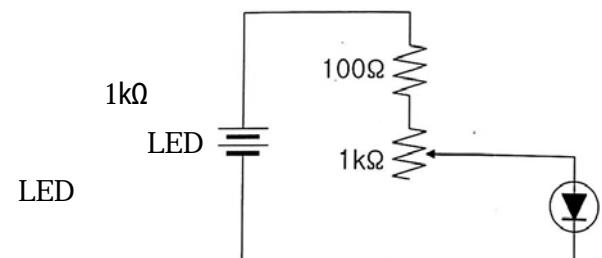
가

가

3. LED

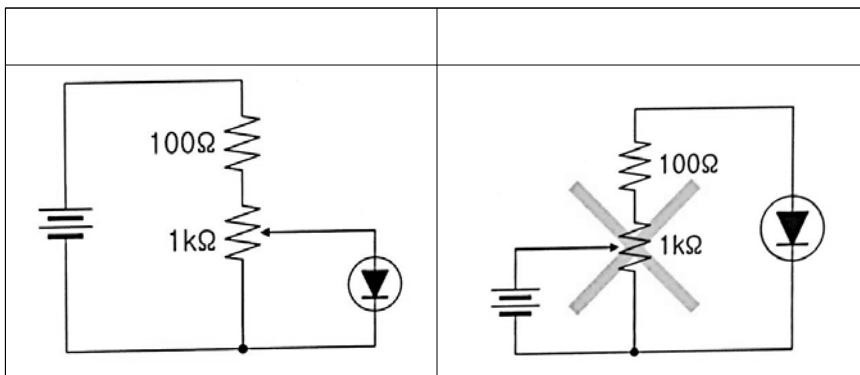
LED
가
100

100~1100



가
LED

?

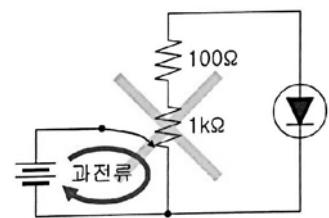


[] 가

100

LED

[] 가
(+)(-) 가



활동 2 반도체와 센서로 LED켜고 끄기

1. CdS

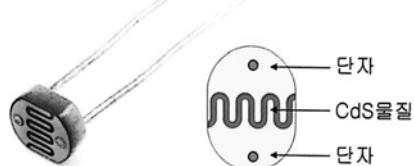
CdS()

가

CdS가

CdS

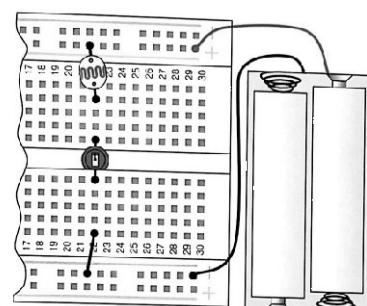
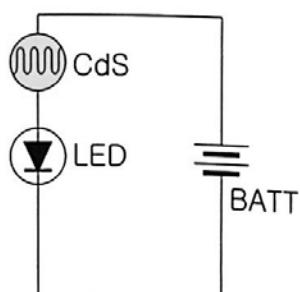
CdS



CdS

가

1



LED

CdS가

CdS가

가

CdS

LED가

가

CdS

CdS

가

LED가

CdS 가

LED가

?

가

2.

가 1
0 1
가 1 0
가

		가
()	가	

NPN PNP
3 (Base), (Collector), (Emitter)

(B) :

(C) : (B)

가

가

(C)

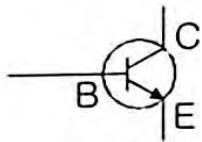
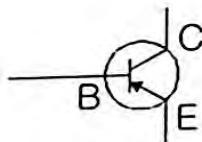
가

(E) :

(B)

(C)

가

	NPN	PNP
	 C+ , D+ 가	 A+ , B+ 가
		

LED

LED

?

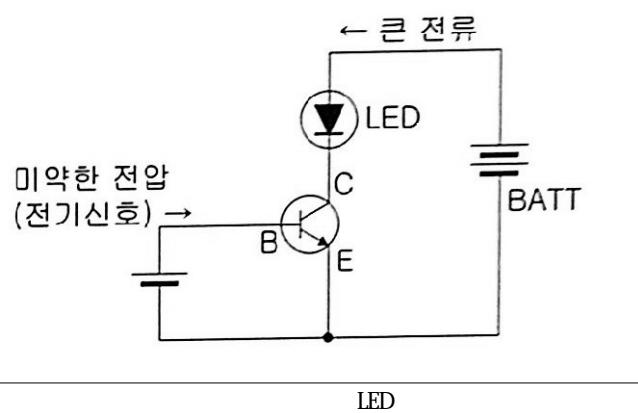
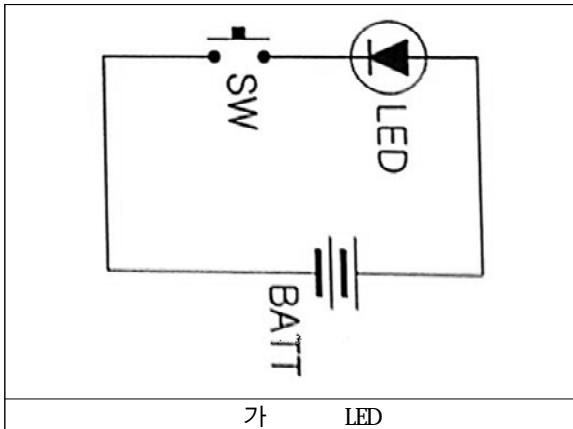
가

LED

가

가

LED



(C)

(E)

(C)

(E)

가

(B)

가

가

?

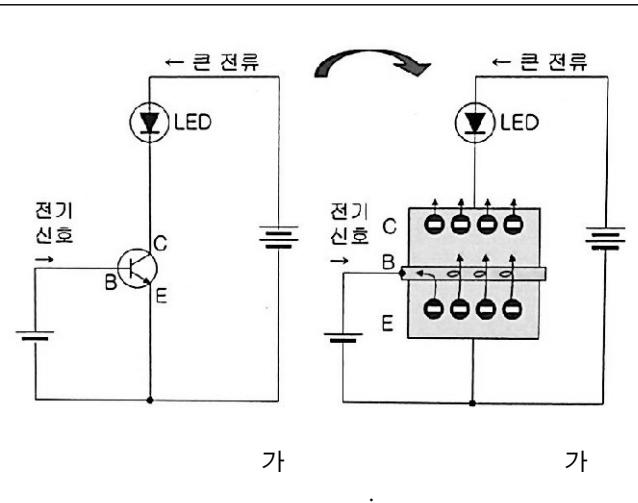
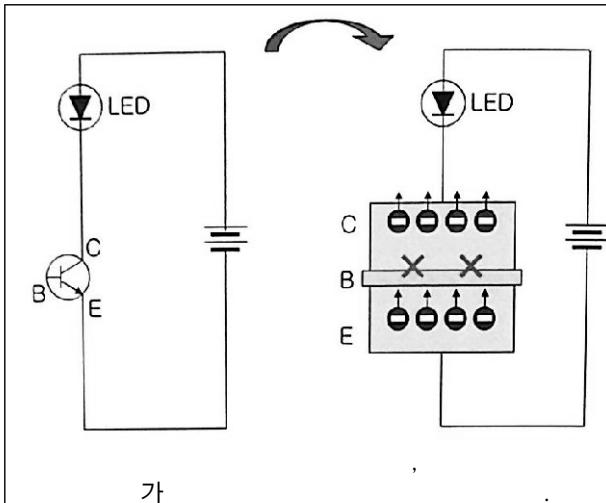
, (B)

(E)

(B)

(C)

가



(-)

가

(-)

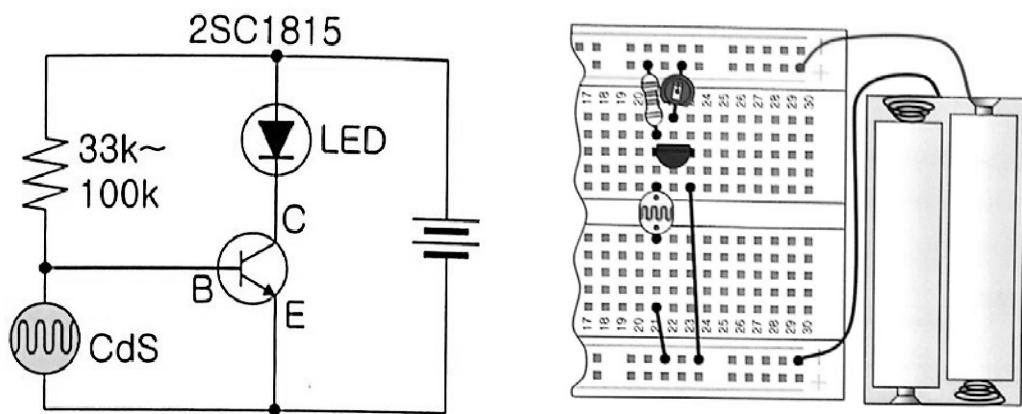
가

가

가

(?)

The diagram illustrates a circuit for a light-controlled switch. It features two transistors: an NPN transistor (top) and a PNP transistor (bottom). The NPN transistor's base (B) is connected to the collector (C) of the PNP transistor. The NPN transistor's collector (C) is connected to ground. The NPN transistor's emitter (E) is connected to one terminal of a 12V DC power source. The other terminal of the power source is connected to the PNP transistor's collector (C). The PNP transistor's base (B) is connected to the output of a photoresistor (CdS) labeled '가' (ga). The PNP transistor's emitter (E) is connected to ground. The output of the NPN transistor (C) is connected to the base of another NPN transistor labeled 'NPN' and '가' (ga). This second NPN transistor's collector (C) is connected to the LED labeled 'LED가' (LED ga). The LED's anode is also connected to the 12V power source. The LED's cathode is connected to ground.



가 가

LED가

가

LED

활동

3

아두이노로 LED 제어하기

IC

가

(micro controller)

가

가

가

1.

(UNO)

(Leonardo)

14

6

가

0 ' 1 '

5V

1 '

5V

0 '

0V

0 ' 1 ' 가

가

(UNO)

(Leonardo)

0~1023

5V

5V

1023

0V

0

2.5V가

, 512

(UNO)

(Leonardo)

, 20

2.

IDE

<http://arduino.cc/en/Main/Software>

OS

Linux

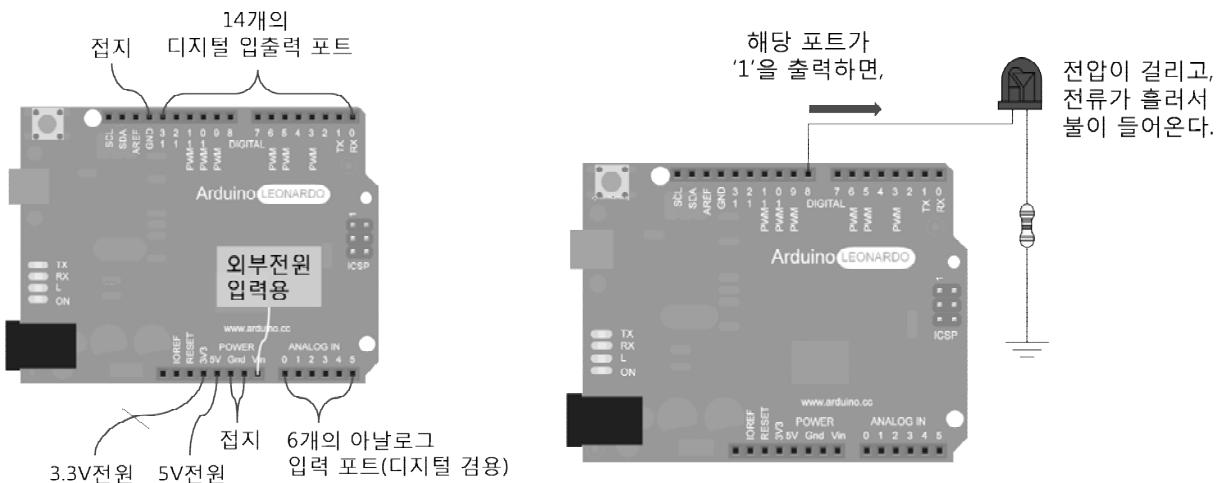
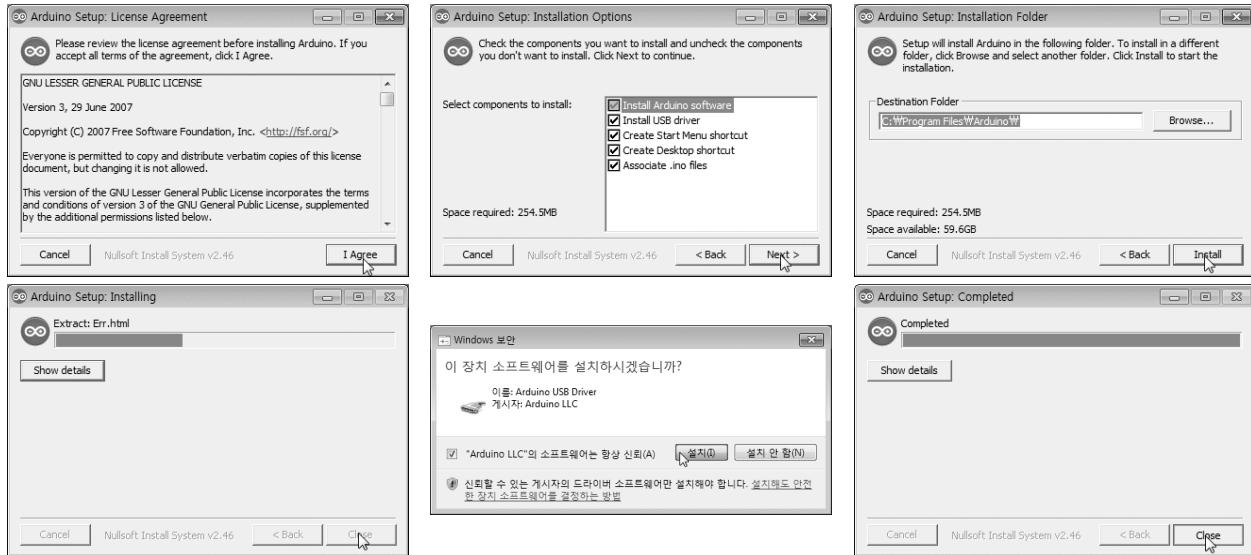
Windows

OS Windows, Mac,

가

가

[(I)]



3. IDE

(Sketch)

(Sketch)

PC

USB-B

PC USB

USB-B

(UNO)

가(MEGA)
USB

(LEONARDO),

(NANO),

(MICRO)

5 (Micro- 5 pin)

5

PC USB

가

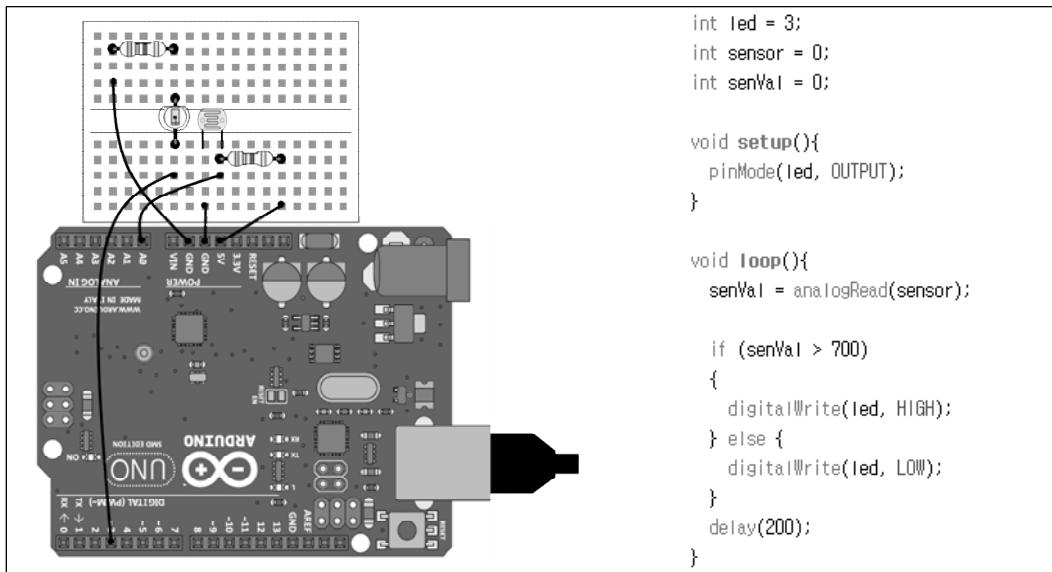
가

LED

[]-[] , , COM1 ' COM8 '
 COM1 ' PC
 COM2 ' 가 .
 5 가 .
 . COM5 ' COM6 ' COM7 ' COM8 ...
 IDE .
 . 가

4.

5V	10kΩ	.	CdS	A0	.
CdS	GND	. LED (+)	digital 3	. LED (-)	
330	.	GND	.		



6 2 1.

6

가

활동

4

發明 아이디어 생각하기

?

:

:

< >

< >:

LED



? ? ? ? 3D ?

활동 1 가변저항으로 빛의 밝기 조절하기

1. 가

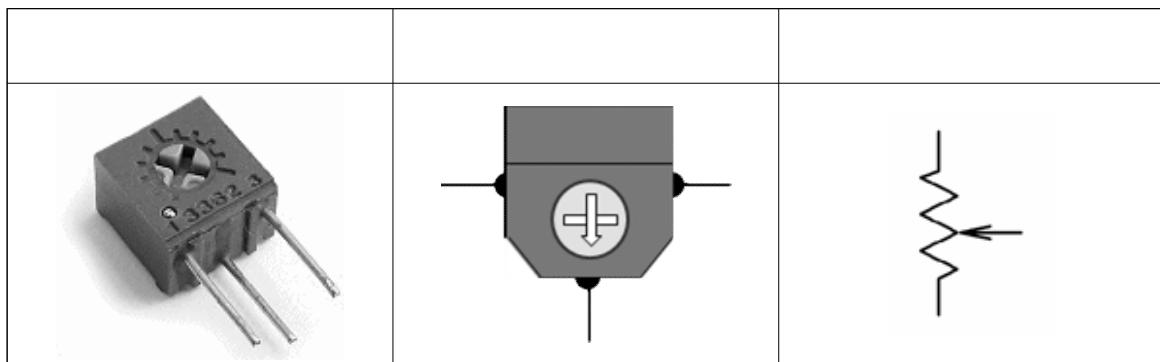
가 , , 가



가 C , , 가

3 가 , 가

2.



102 ' 가
0 ' 102 ' 10 ' 0 '
1000 ; 1kΩ

	101	102	103	104
()	0~100	0~1,000 (0~1k)	0~10,000 (0~10k)	0~100,000 (0~100k)

가

가

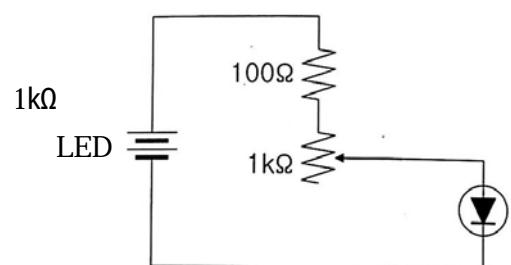
가

3. LED

LED 가
100

100~1100

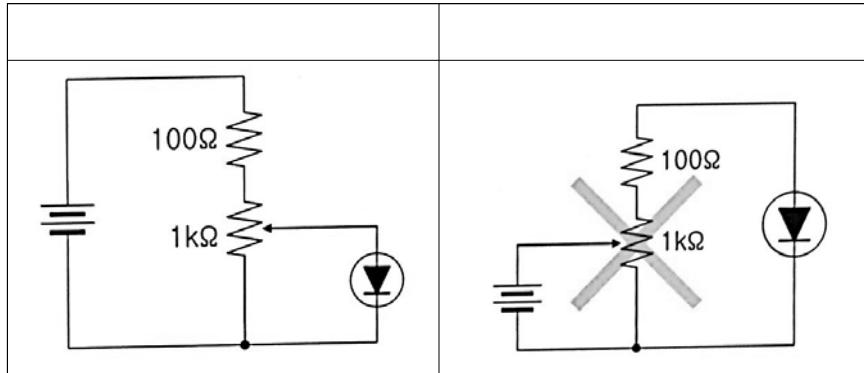
LED



가 LED

?

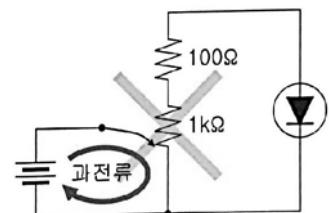
LED



[] 가

100

[] 가
(+) (-)
가



활동 ② 반도체와 센서로 LED켜고 끄기

1. CdS

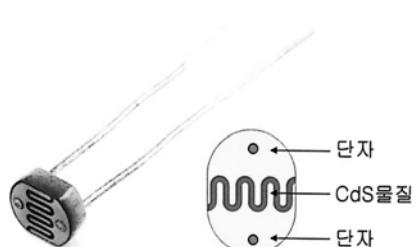
CdS()

가

CdS가

CdS

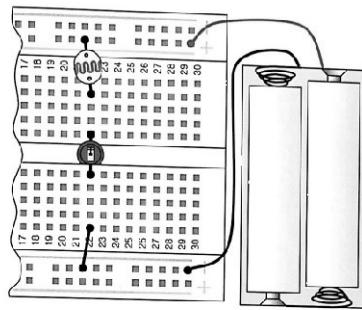
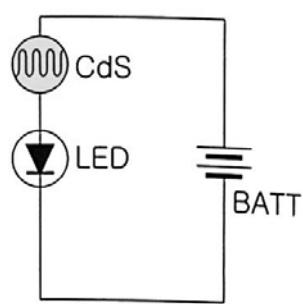
CdS



CdS

가

1



LED 가
 CdS 가
 CdS
 CdS 가
 LED가
 ?
 가

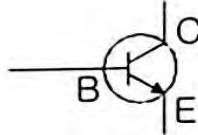
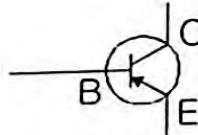
2.
 가
 1,
 0,
 1,
 0,
 가

		가
()	가	,

NPN
 3 (Base),
 PNP
 (Collector),
 (Emitter)

(B) :
 (C) : (B) 가
 (E) : (B) (C) 가

LED

	NPN	PNP
	 C+ , D+ 가	 A+ , B+ 가
	 가 B E	 가 E B

LED

?

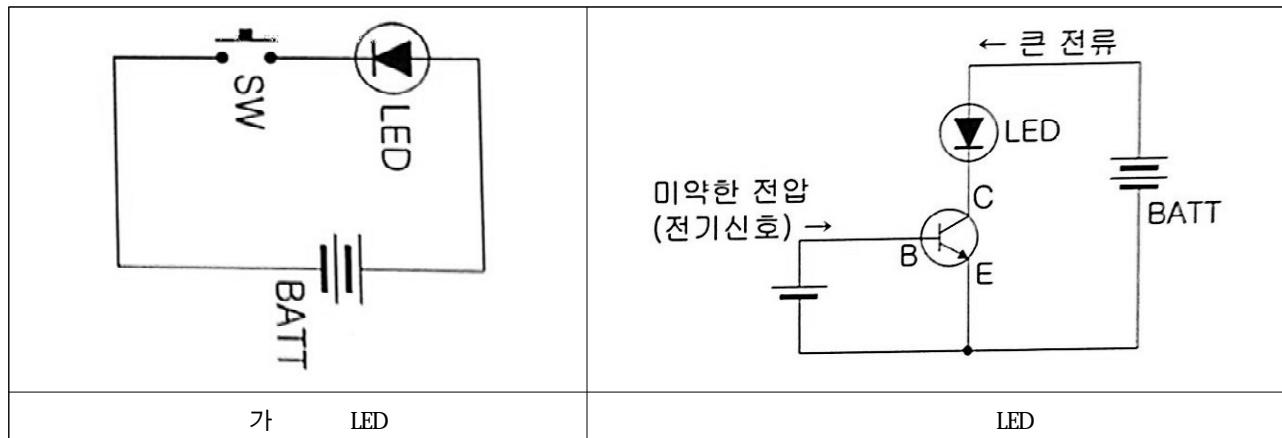
가

가

LED

가

LED



(C)

(E)

(C)

,

(B)

,

(E)

가

가

,

(C)

(B)

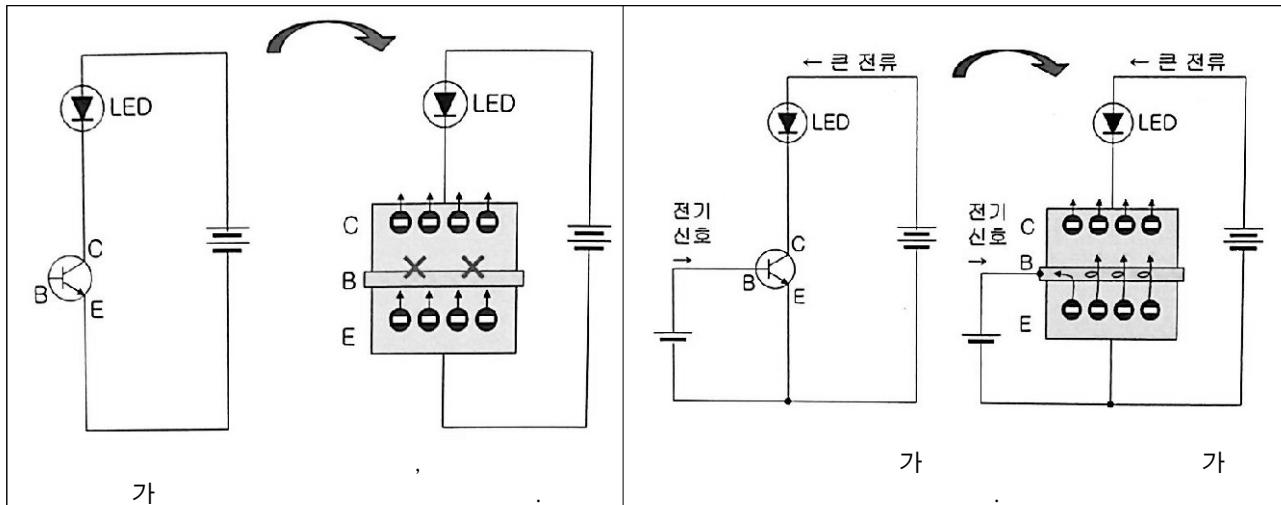
가

(C)

가

?

(-)



(-)

가

(-)

가

가

(?)

NPN

P

가

B-

P-N

N

B-C

A diagram of a rectangular bar magnet. The top face is shaded gray and has a capital letter 'N' printed in the center. The bottom face is white and has a capital letter 'S' printed in the center. A thin horizontal line extends from the left side of the rectangle, representing the magnetic field.

PNP

가

NPN

, PNP

NPN

NPN

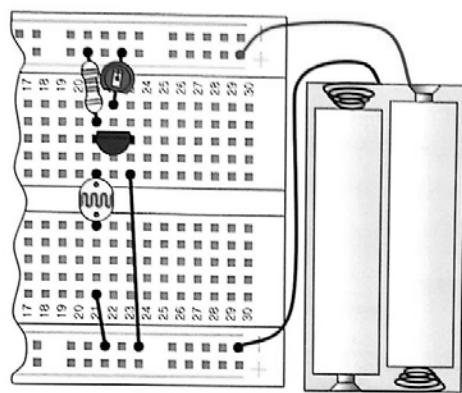
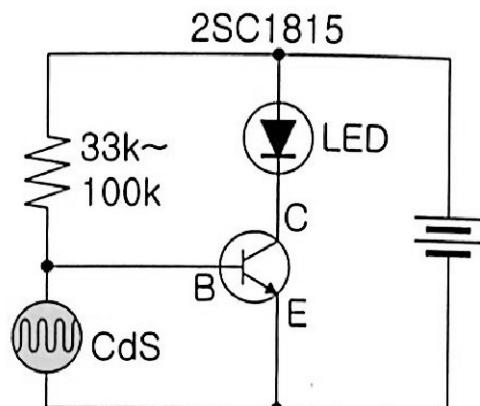
NPN

CdS가 가

LED 가

LED가

LED가



LED

가 가

가

LED가

가

활동 3 아두이노로 LED 제어하기

IC

가

(micro controller)

가

가

가

1.

(UNO)

(Leonardo)

14

6

가

0 1

5V

5V

0

0V

가

가

(UNO)

(Leonardo)

5V

0~1023

5V

1023

0V

0

2.5V

512

(UNO)

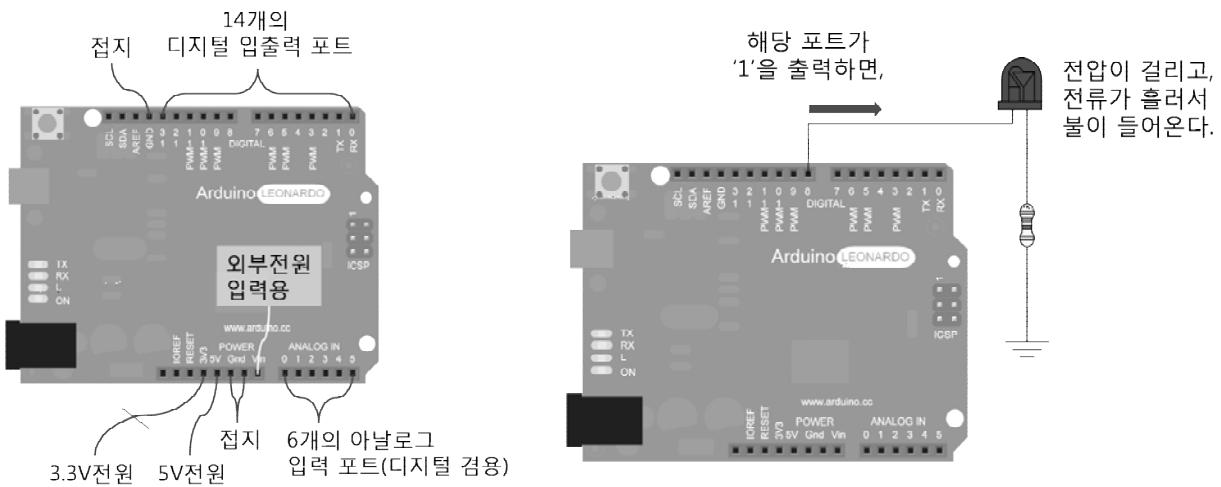
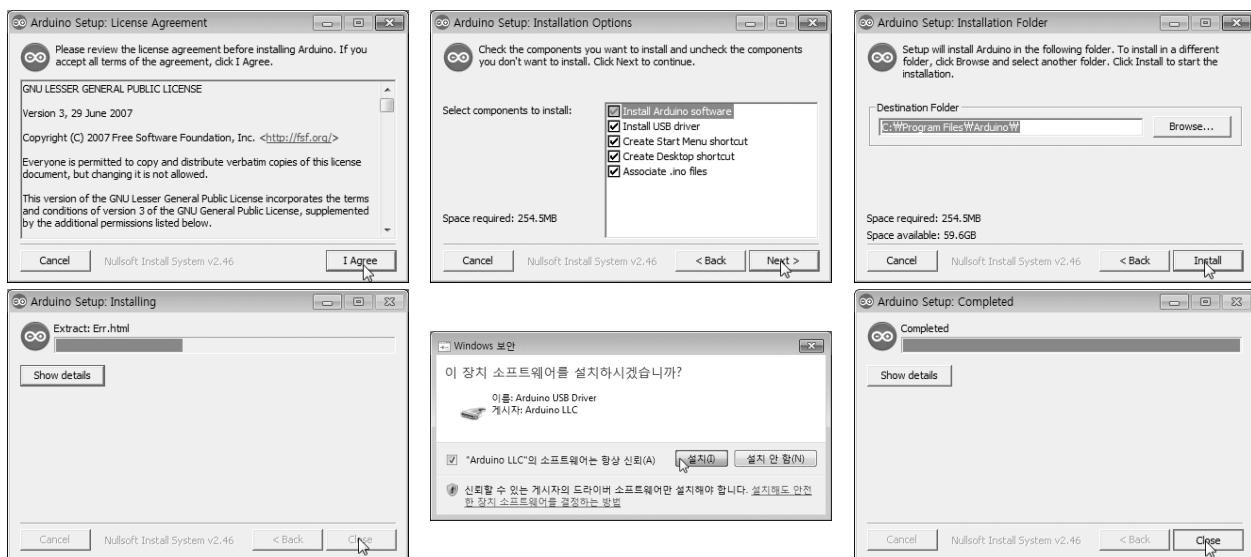
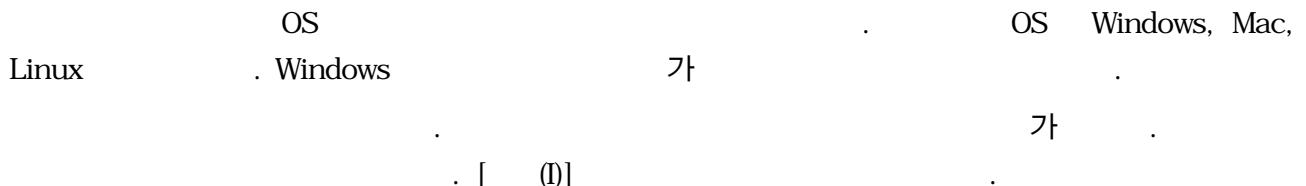
(Leonardo)

20

2.

IDE

<http://arduino.cc/en/Main/Software>



3. IDE

(Sketch) '

(Sketch)

PC

USB-B

PC USB

USB-B

LED

(UNO)

가(MEGA)

(LEONARDO),

(NANO),

(MICRO)

5 (Micro-5 pin)

5

PC USB

가

가

[]-[]
PC USB

Arduino Uno
(RS-232)

[]-[]
COM1 , PC
COM2 ,
5 가

, COM1 , COM8
, COM5 ; COM6 ; COM7 ; COM8 ...
IDE 가

4.

5V

10kΩ

CdS

GND

CdS A0

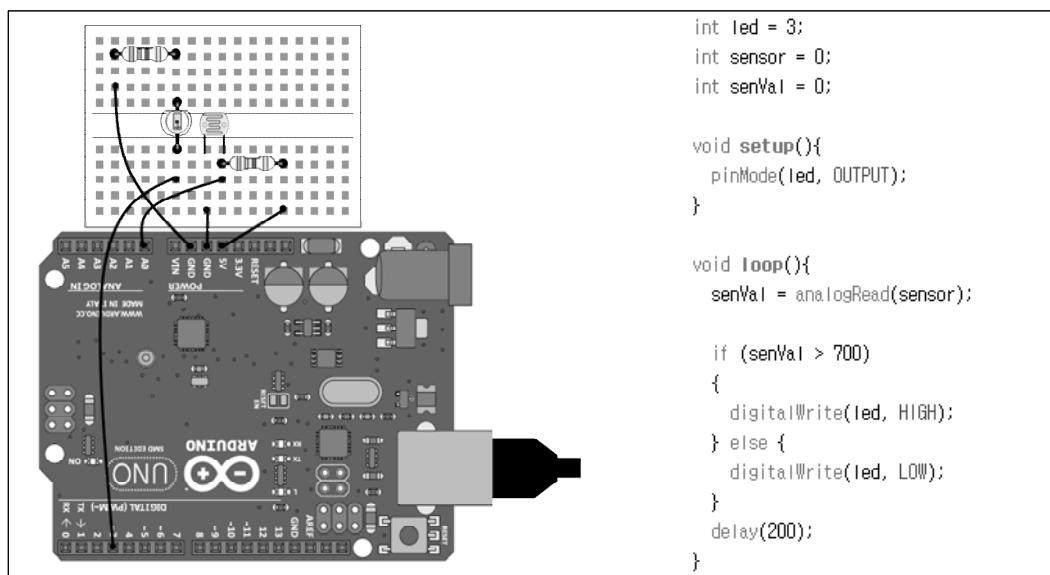
LED (+)

digital 3

LED (-)

330

GND



활동

4

發明 아이디어 생각하기

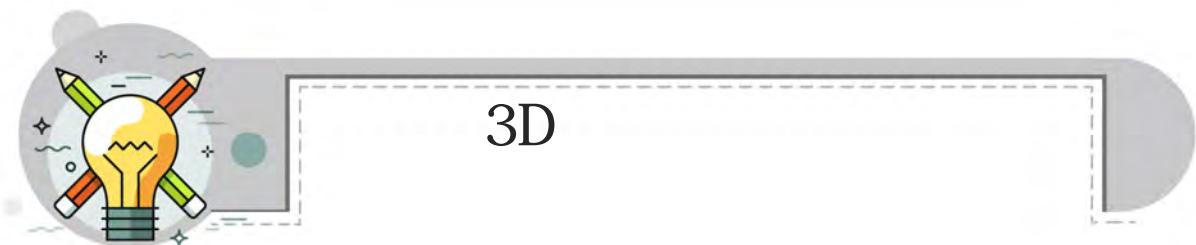
?

:

:

< >

< >:



4 : [01-02]

[4 01-03]

[4 02-04]

가

5,6 : [6 02-06]

[6 05-03]

[6 05-04]

1. 3D

2. 3D

1. 3D

2. 3D

3. 3D

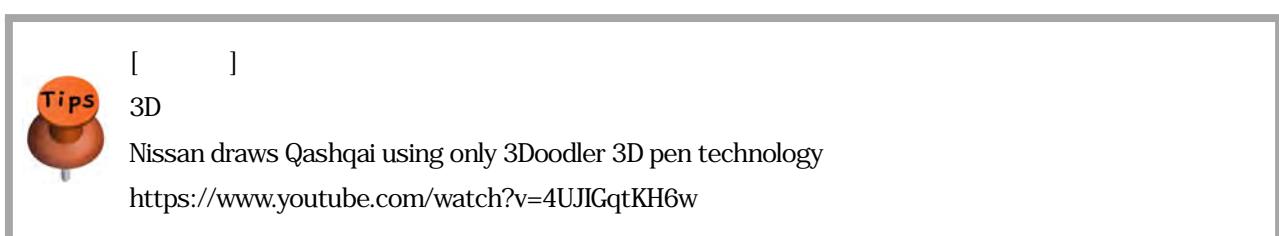


3D
. 3D

?

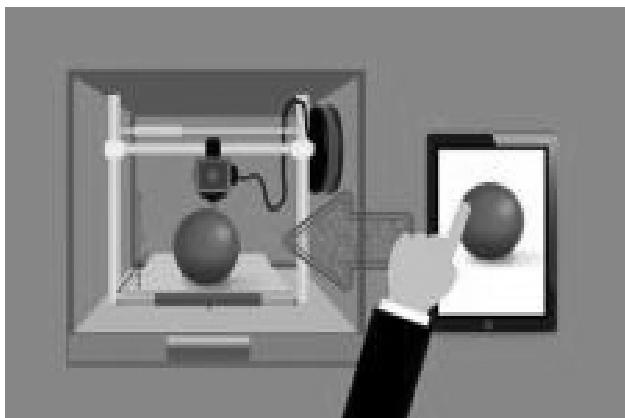
3D 가 . 3D 20

3D 가 , .
3D ?
3D ?



활동 1 3D 프린팅 알아보기

1. 3D



3D

가 2

3

3D

3

가

3D

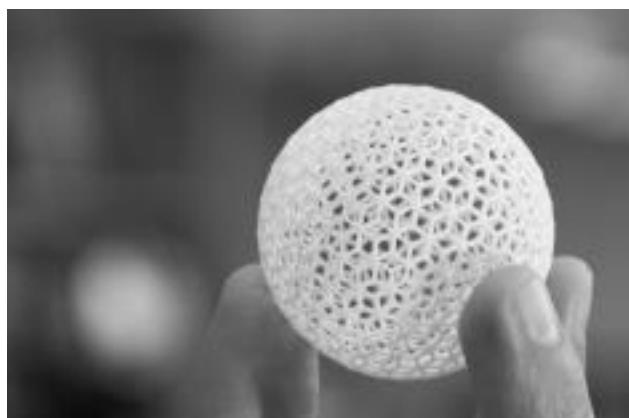
가

1980

3D

3D

2. 3D



3D

,

3D

가

,

가

3D

3D

3. 3D

3D

(Modeling)-

(Printing)-

(Finishing)

3

3D

3D

4. 3D

3D

가

3D

가

3

활동

3

3D펜 연습하기

1. 3D ?



: <https://intl.the3doodler.com/>

3D

3D

3D

3D

가

(MIT)

3D

2010

(3Doodler)

(WobbleWorks)

가

(FDM)

3D

가

가

가

3D

가

가

가

ABS PLA

3D

가

1

2

가

, 3

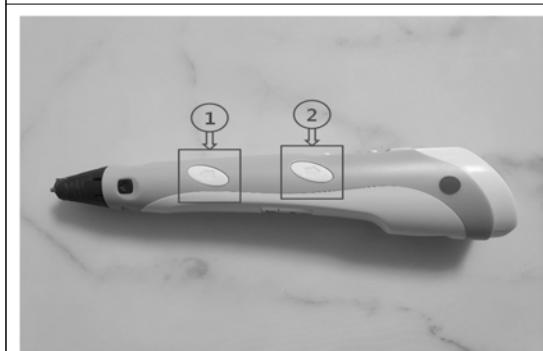
?

2. 3D

가. 3D



3D



가

3D

가

가

3D

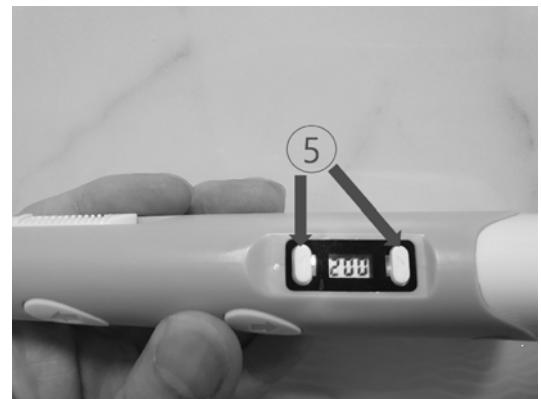
가



가 가



():
PLA가



(): PLA
가 180 ~200



:
가
가



3D

3D

3D

3D

3D



PLA



ABS



1) PLA

가

ABS

100%

가

60

, ABS

2) ABS

가

가

3D

가

가

가

가

3D

(

)

-3D

가

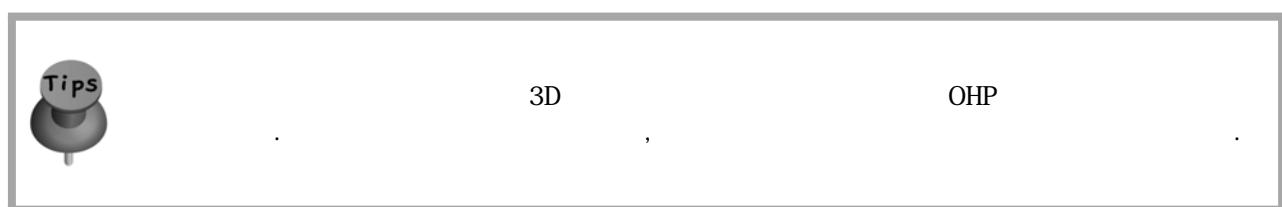
-3D

3. 3D



3D

?



활동 3 3D 펜으로 생활용품 디자인 하기



3D

3D

4

,

6

,

.

3D

()

: 3D ,

(, ,

)

< >

3D 프린팅 기술, ‘기적’ 을 출력할까요?

(:<https://m.post.naver.com/viewer/postView.nhn?volumeNo=29143137&memberNo=387676&vType=VERTICAL>)

“

”

2013

가 3D

3D

16

900

3D

19

3D 가

3D

3D

3D

‘ , ’

가 가

3D

3

3D

가

가

‘ , ’ 3D

3 1

3.1

1,762

101

가 3D

가

3D

가

, 3D

가



3D



3D

?

3D

2017

3D

가

3D

20

3D

가

3D

?

3D

3D

, 3D



[]

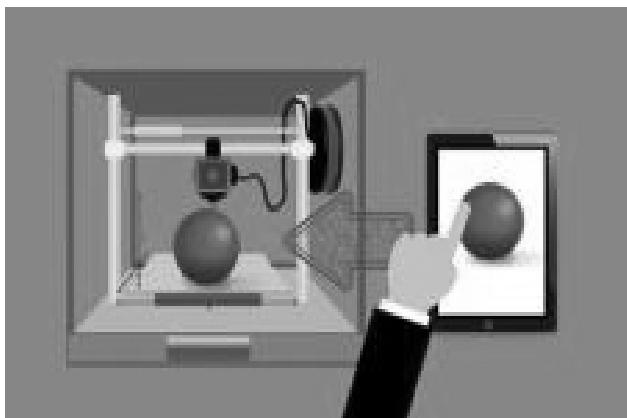
3D

Nissan draws Qashqai using only 3Doodler 3D pen technology

<https://www.youtube.com/watch?v=4UJIGqtKH6w>

활동 1 3D 프린팅 알아보기

1. 3D



3D

가 2

3

3D

3

가

3D

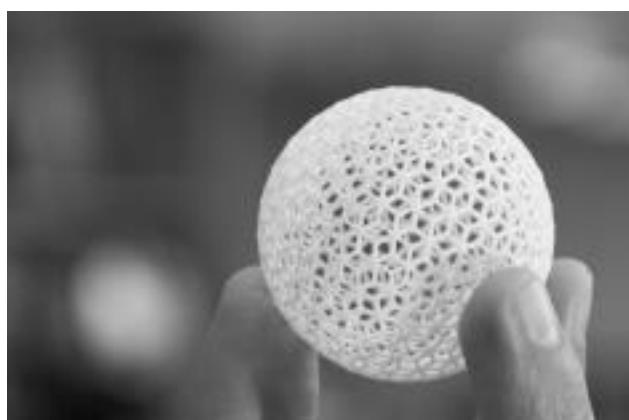
가

1980

3D

3D

2. 3D



3D

,

3D

가

,

가

3D

3D

3. 3D

3D

(Modeling)-

(Printing)-

3

(Finishing)

3D

3D

4. 3D

3D

가

3D

가

3

활동

3

3D펜 연습하기

1. 3D ?



: <https://intl.the3doodler.com/>

3D

3D

3D

3D

가

3D

가

3D

(3Doodler)

(MIT)

2010

(WobbleWorks)

3D

가

가

가

가

가

(FDM)

가

가

가

ABS PLA

3D 가

3D

1

2

가

, 3

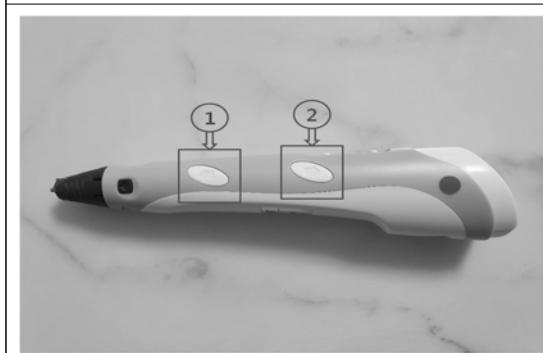
?

2. 3D

가. 3D



3D



가

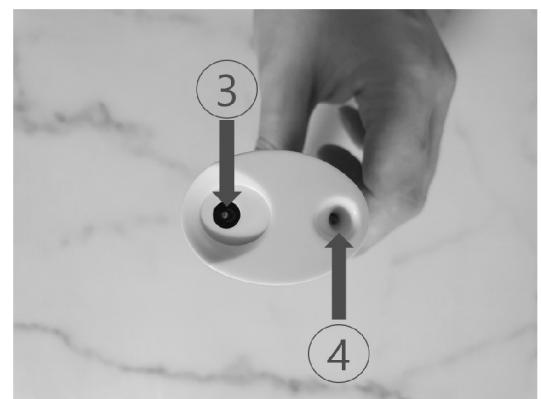
3D

가

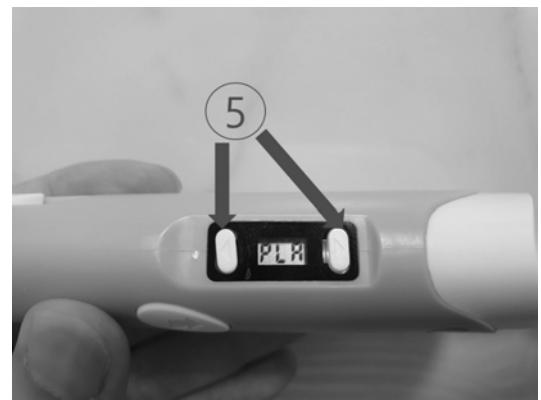
가

3D

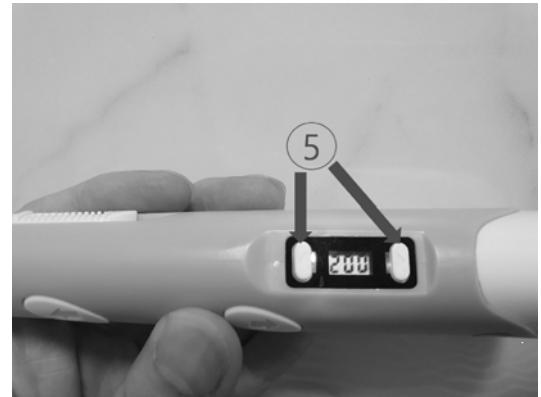
가



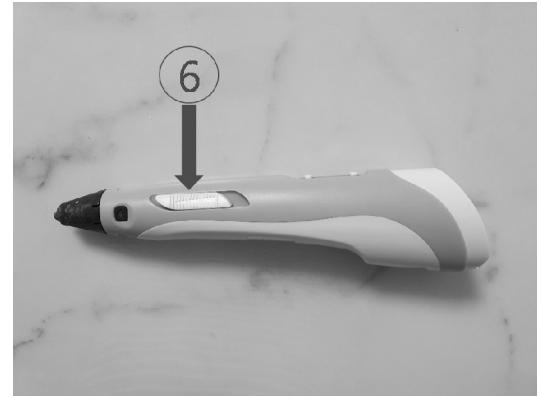
가 가



():
PLA 가



(): PLA
가 180 ~200



:
가 가



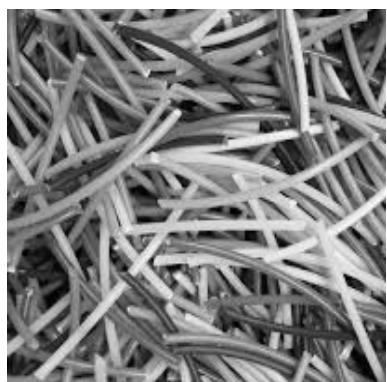
3D

3D

3D

3D

3D



PLA



ABS



1) PLA

가

ABS

100%

가

60

, ABS

2) ABS

가

가

3D

가

가

가

가

3D

(

)

-3D

가

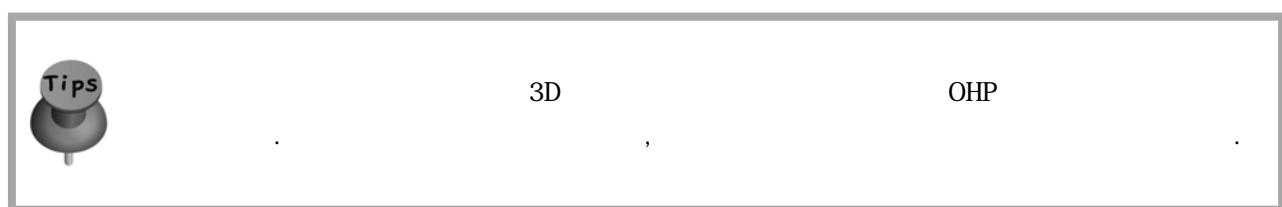
-3D

3. 3D



3D

?



활동 3 3D 펜으로 생활용품 디자인 하기



3D

3D

3D

()

: 3D ,

(, ,

)



5,6	: [6 02-06]
	[6 05-04]
5,6	: [6 02-02]
	[6 02-04]

	1. 3D	.	.
	2. 3D	.	.

	<ol style="list-style-type: none">1. 3D2. 3D3. 3D
--	---



3D 가

가

가 3D

가 “ 3D

“ 3D

1

가

. IT,

300

3D

3D

가

3D



3D

3D

가

가

3D

활동 1

3D 프린터의 특징 이해하기

1. 3D

3D

3D

3D

3D

3D

가

가

가

,

,

,

,

3D

(NASA)

3D

2. 3D

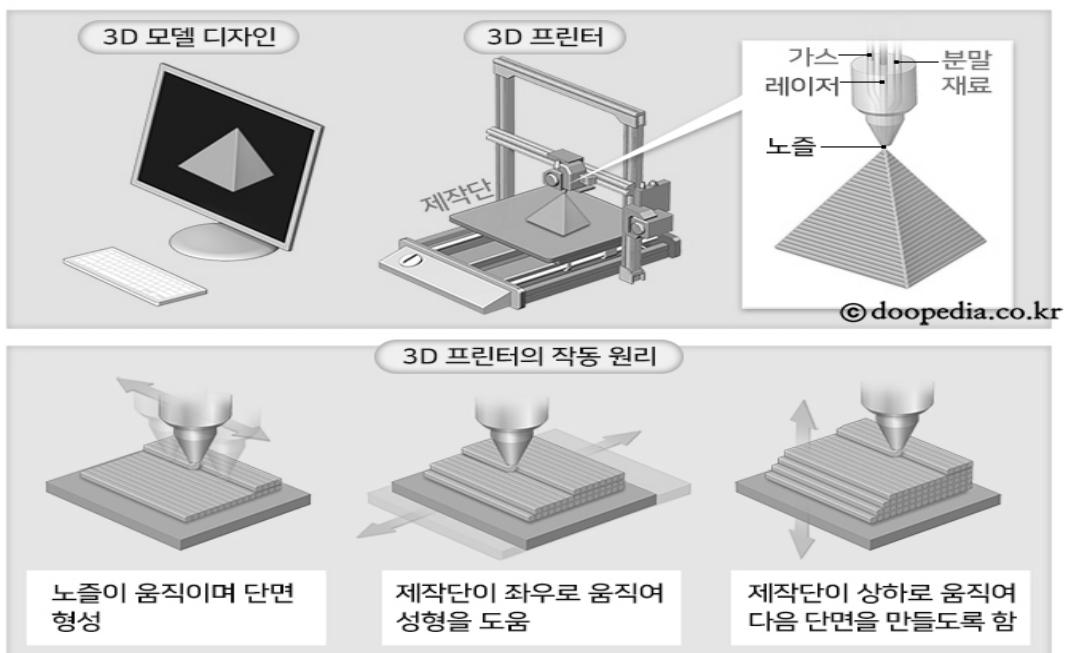
(modeling), (printing), (finishing)

, 3D CAD(computer aided design) 3D

3D

3D

3D



3D

34)



3D

활동

2

3D 모델링 프로그램 알아보기

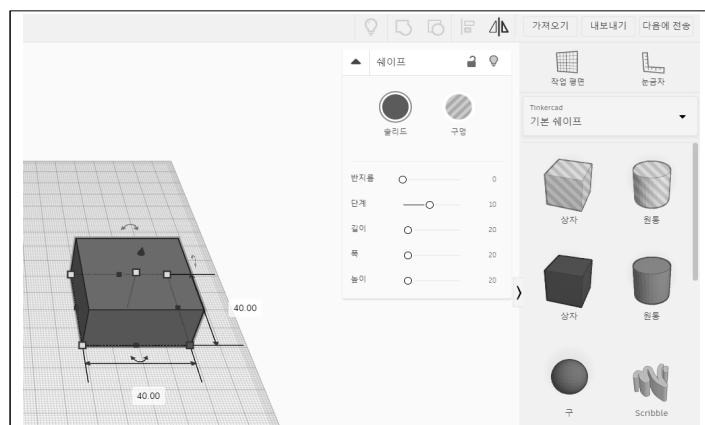
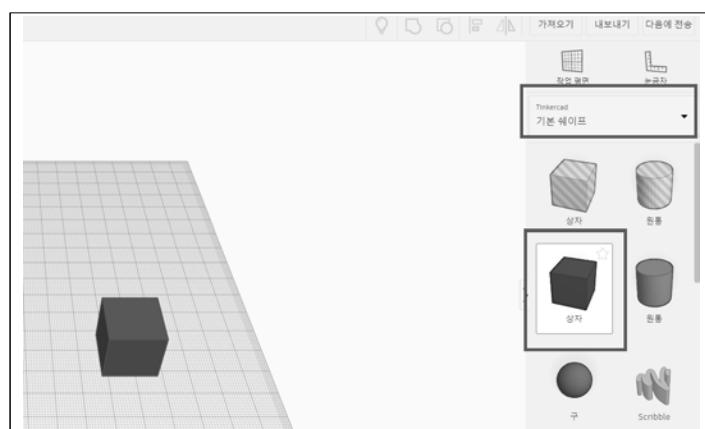
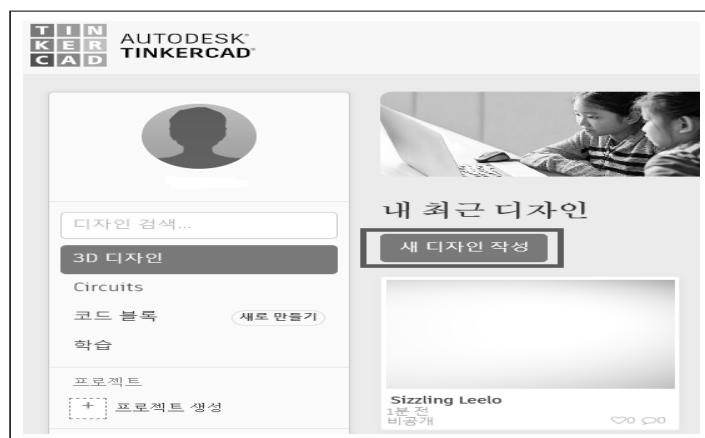
(Tinkercad)

3D

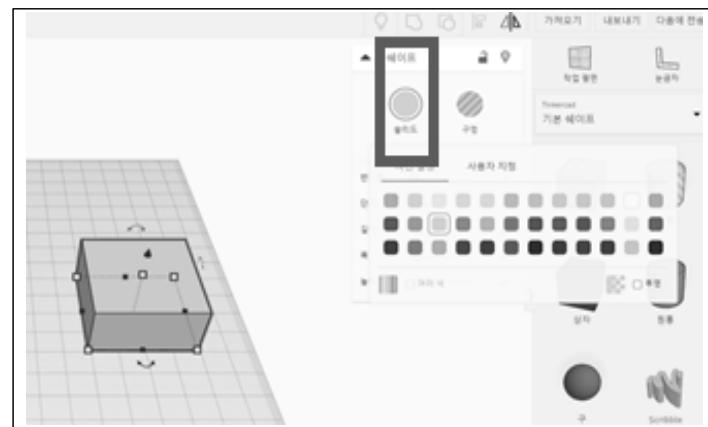
(www.tinkercad.com)

3D

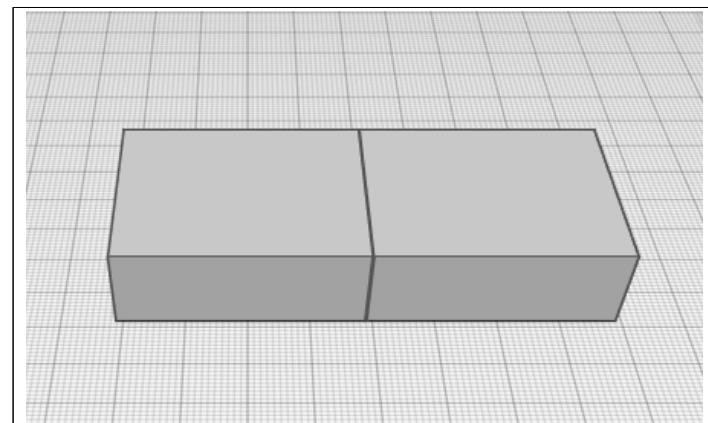
34) <https://terms.naver.com/entry.nhn?docId=1978613&cid=40942&categoryId=32374>



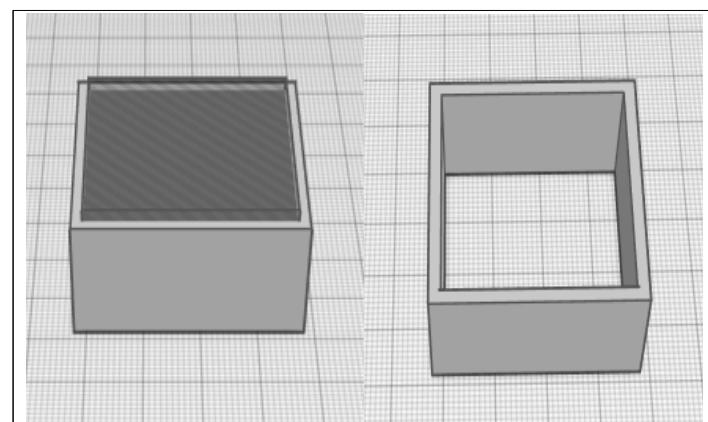
3D



(Ctrl+C)
(Ctrl+V)



가



.STL'

3D



활동

3

3D 프린터를 활용하여 드림캐쳐 만들기

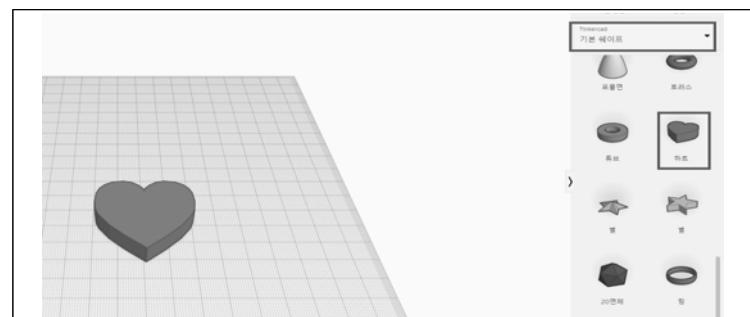
1.

:	
:	
))
))
,	
:	

3D

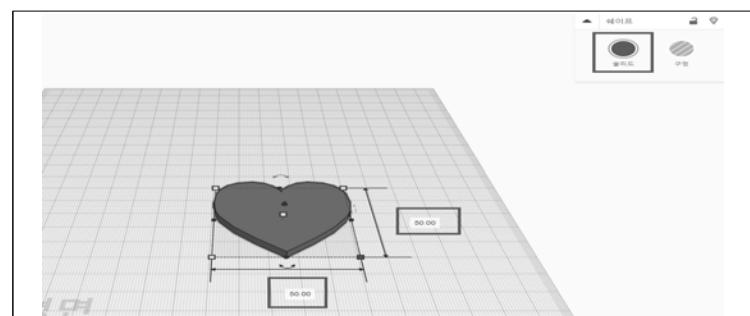
2.

3D

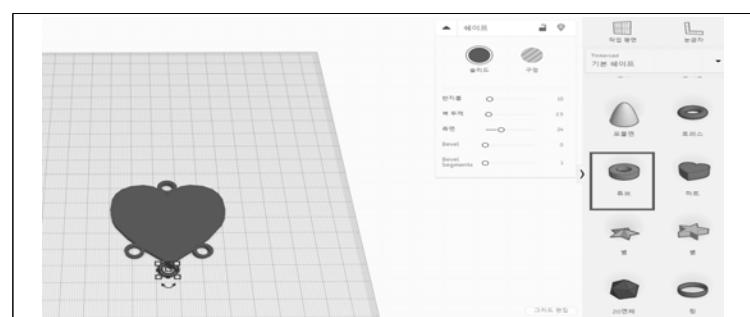


가
5mm

50mm



8mm , 5mm

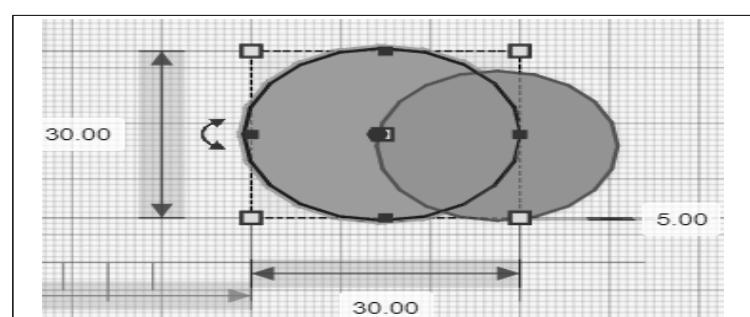
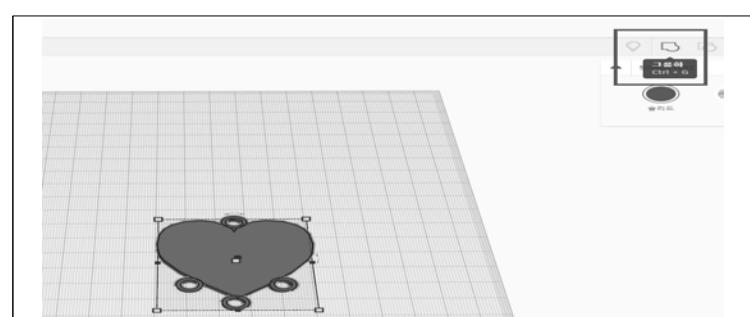


가
30mm
(Ctrl+C)

가

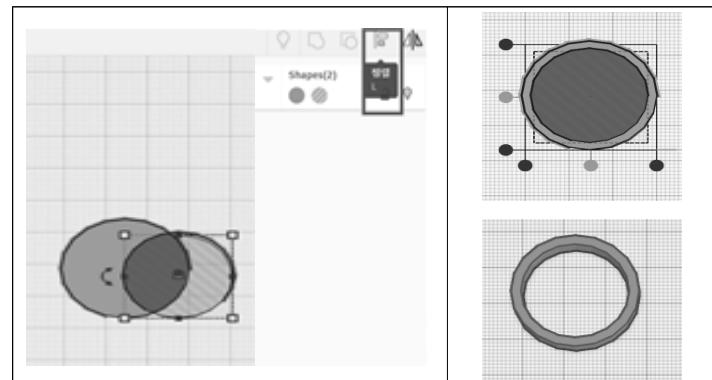
(Ctrl+V)

26mm



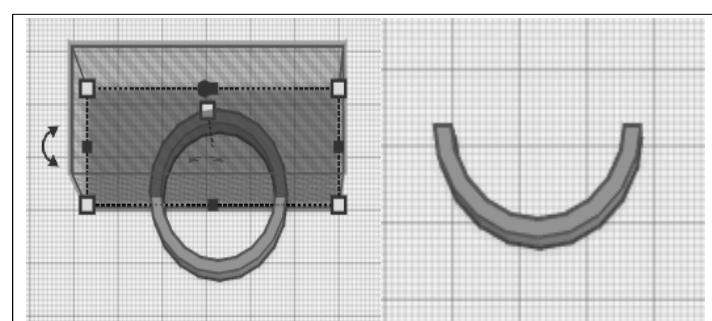
가

가



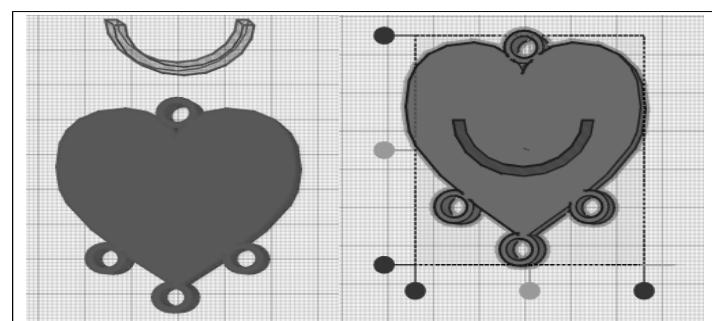
가

가



가

, .STL

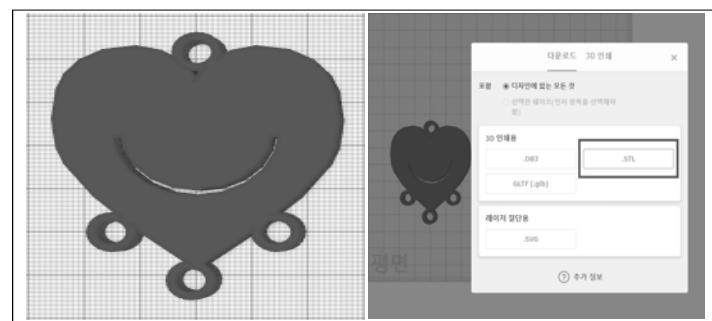


G-code

, 3D

SD

3D



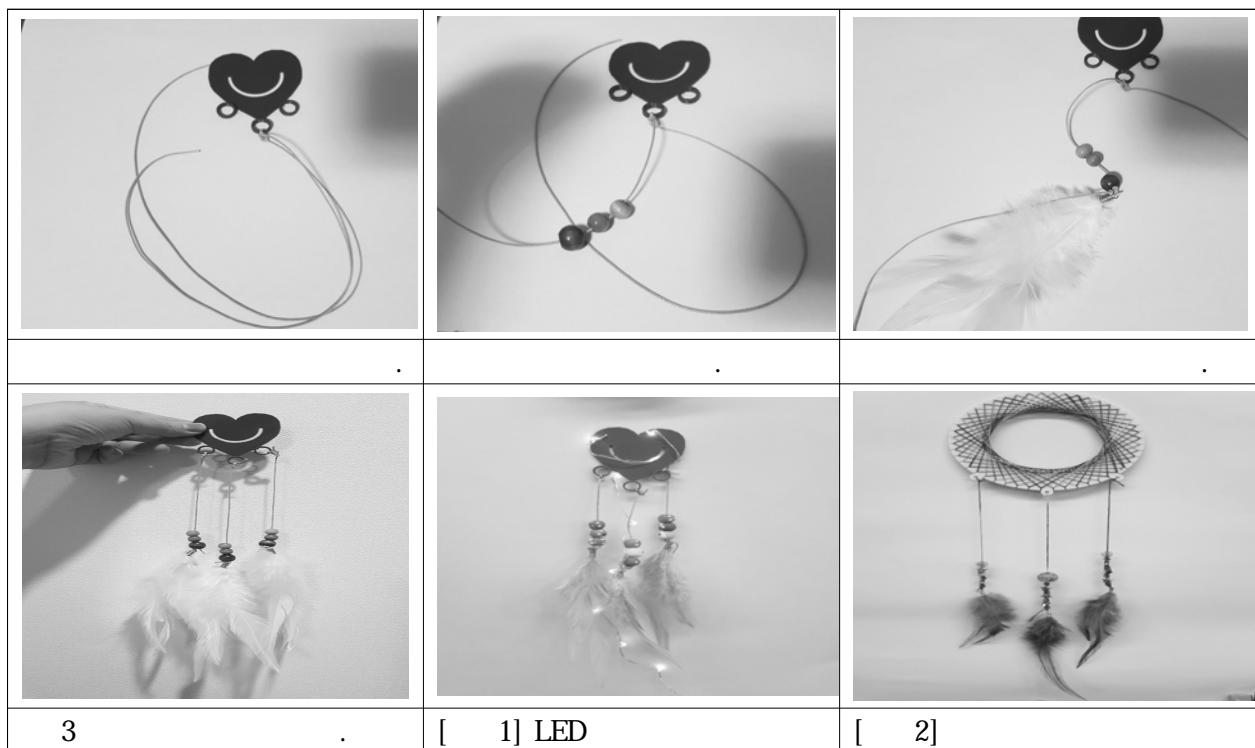
3.

3D

, , , , 가

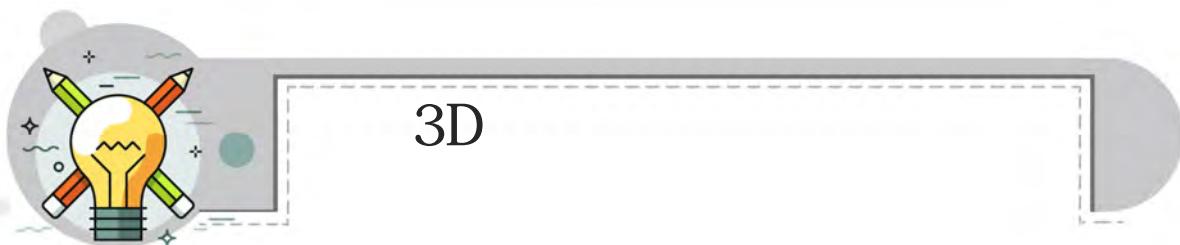


4.



5, 6

5, 6



3D



3D 가

가 3D

가 “ 3D ” IT, ,

가 , 가 ”

300 3D

가가

3D 가 3D 가 3D



3D

3D 가 3D 가

활동 1 3D 프린터의 특징 이해하기

1. 3D

3D

3D

3D

3D

3D

가 . 가

가 , , , , ,

(NASA)

3D

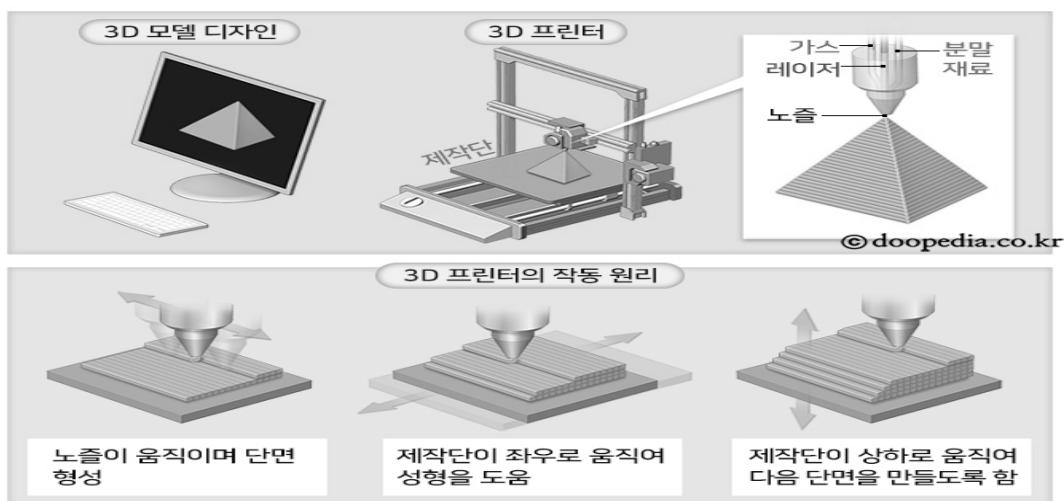
2. 3D

(modeling), (printing), (finishing)

, 3D CAD(computer aided design) 3D

3D

3D



3D

35)



3D

35) <https://terms.naver.com/entry.nhn?docId=1978613&cid=40942&categoryId=32374>

활동 2

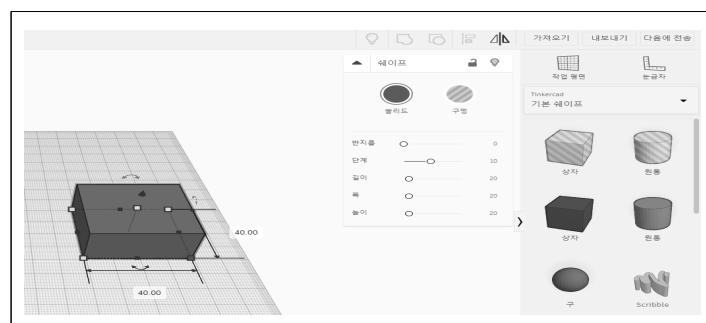
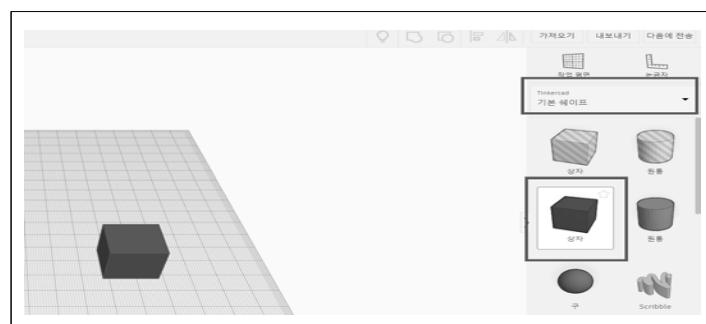
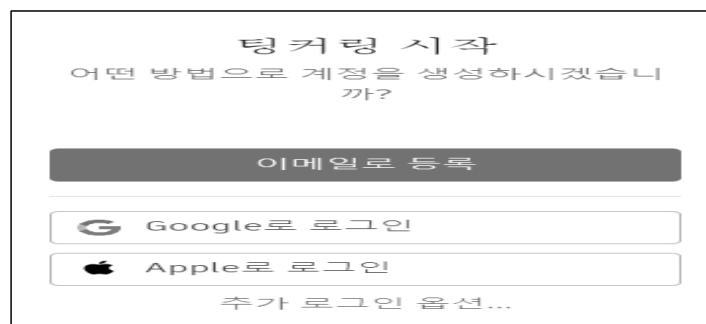
3D 모델링 프로그램 알아보기

(Tinkercad)

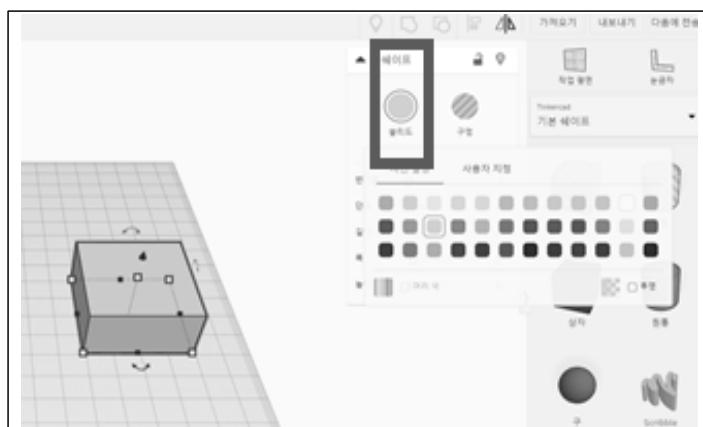
3D

(www.tinkercad.com)

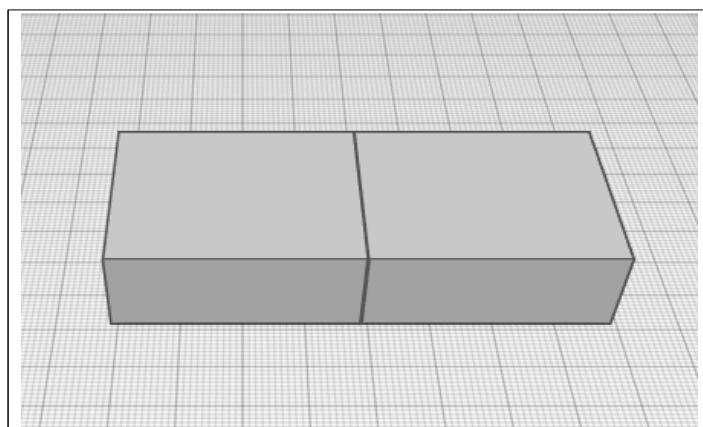
3D



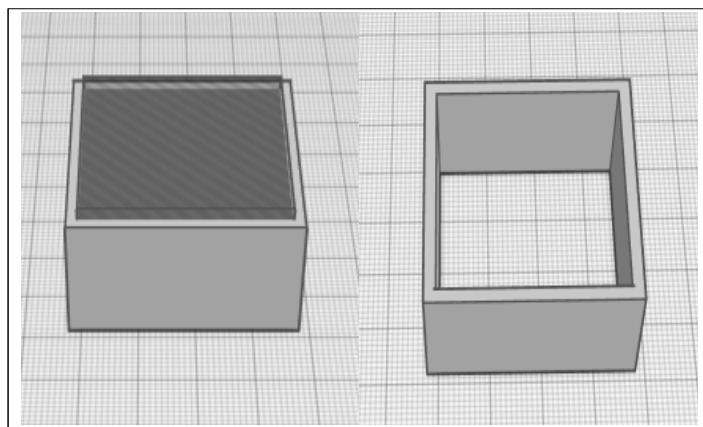
3D



(Ctrl+C)
(Ctrl+V)



가



.STL'

3D



활동 3 3D 프린터를 활용하여 드림캐쳐 만들기

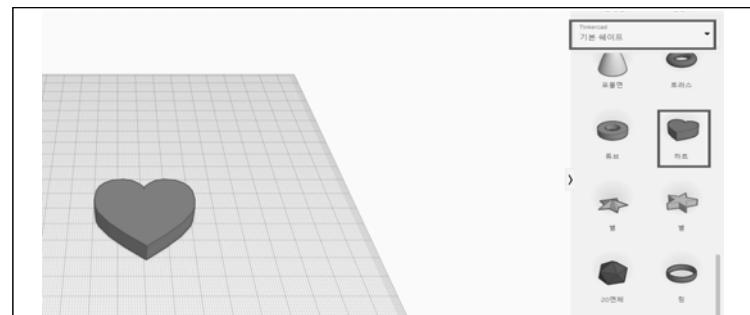
1.

:	
:	
))
))
,	
:	

3D

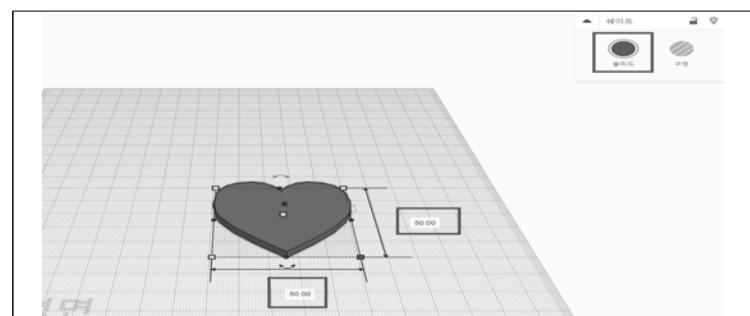
2.

3D

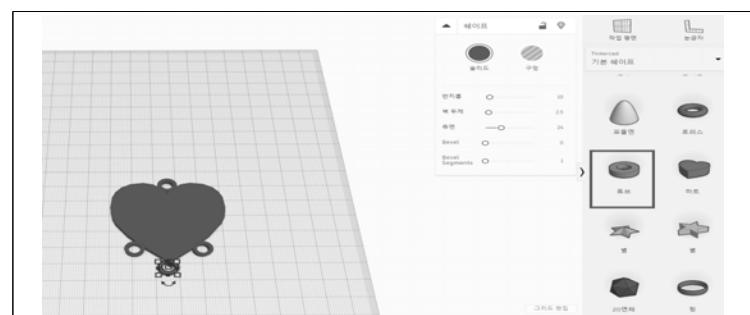


가
5mm

50mm



가
8mm , 5mm



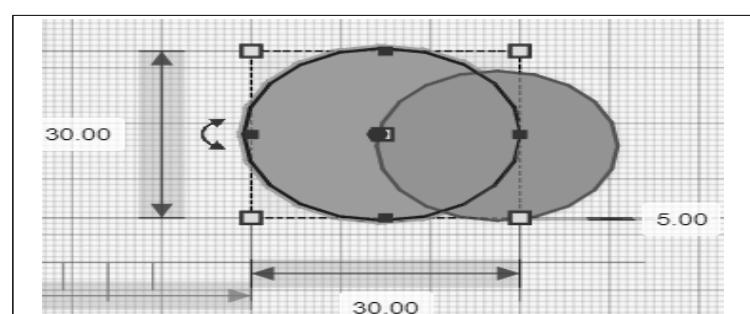
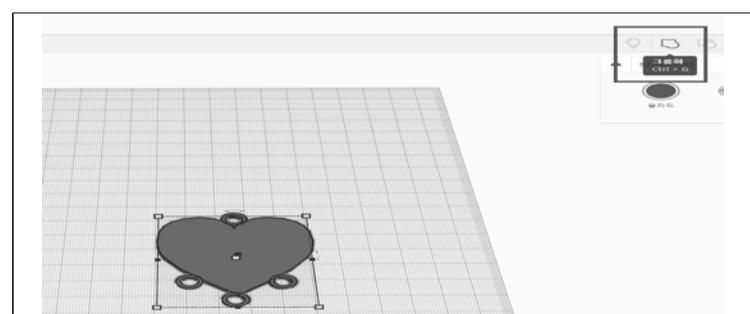
가
30mm

(Ctrl+C)

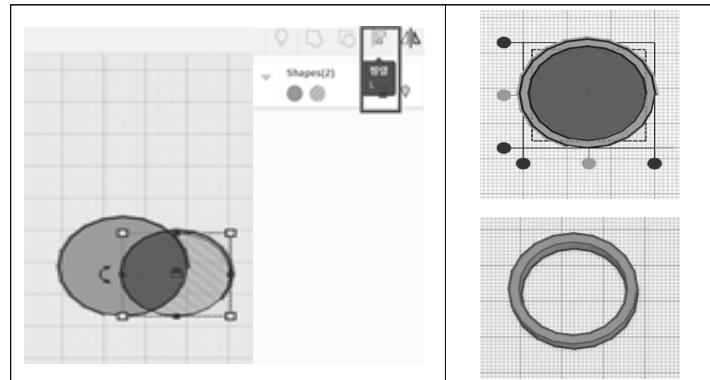
가

(Ctrl+V)

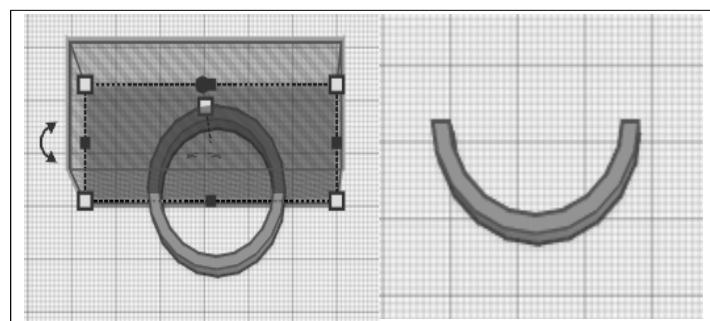
26mm



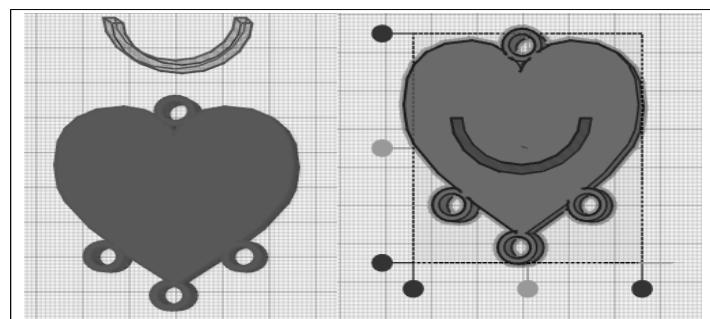
가
가



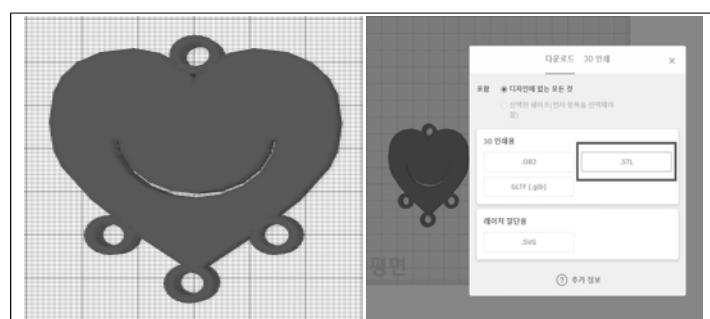
가



가

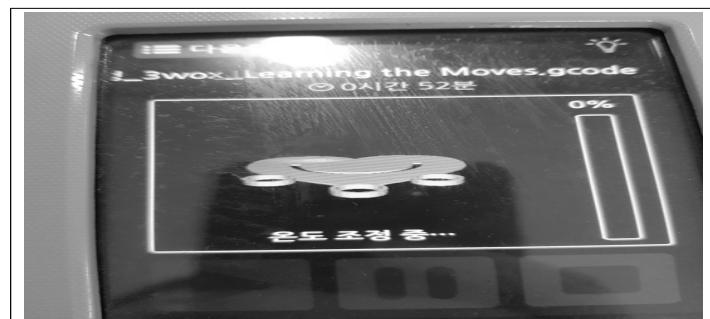


, .STL



G-code
, 3D

SD
3D



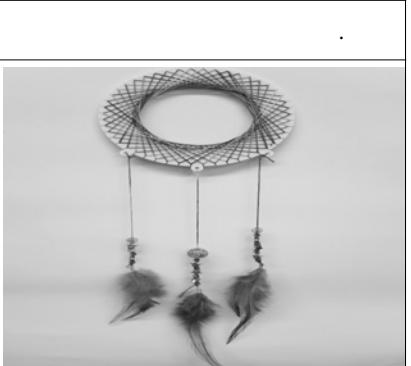
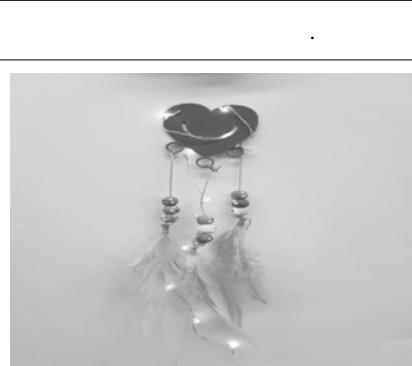
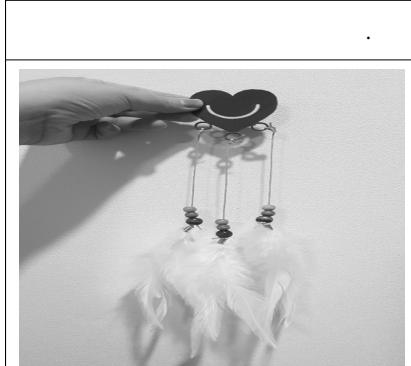
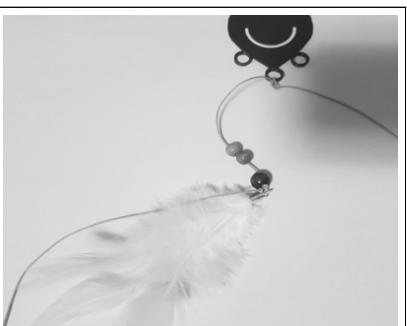
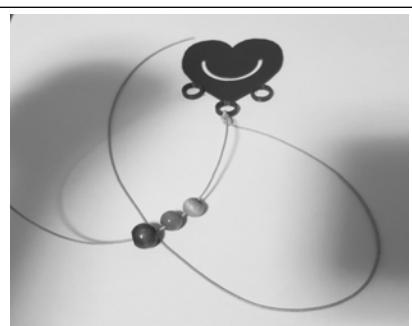
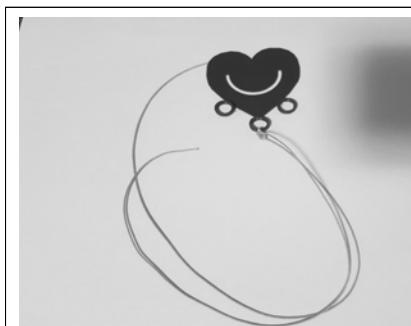
3.

3D

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[1] LED

[2]



Autodraw

6 : [6 07-01] ,

[6 08-02]

6 : [6 01-03] 가

[6 01-04]

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2. ()

3. AutoDraw

1. AutoDraw

2. AutoDraw

3.

4. AutoDraw



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AutoDraw

가

AutoDraw

활동 1 AutoDraw 이해하기

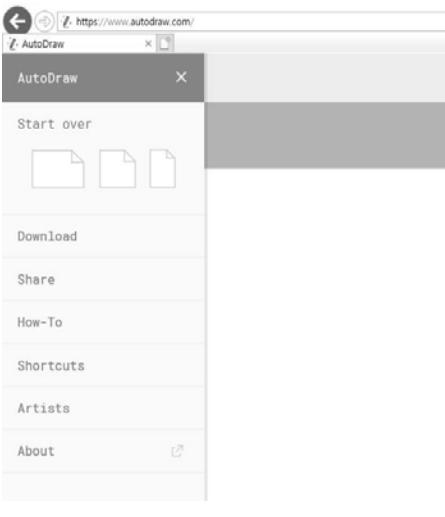
1. AutoDraw

가). AutoDraw ?

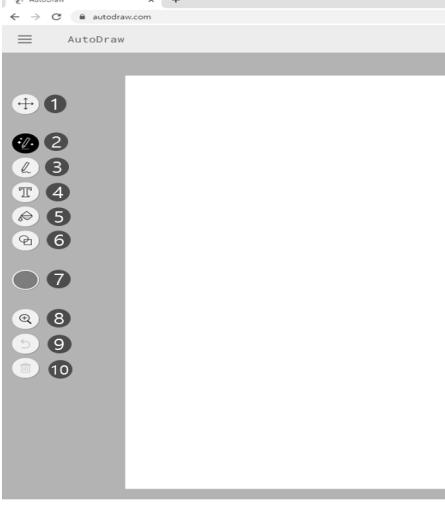
AutoDraw

- . Fast Drawing for Everyone! ! ,
- , Do you mean . , 가

. AutoDraw

	
Autodraw : Autodraw	
	Start over
	Download
	Share
	How-To AutoDraw
	Shortcuts AutoDraw
	Artists AutoDraw 가
	About AutoDraw

. AutoDraw

	
Autodraw : Autodraw	
	Select
	AutoDraw 가
	Draw 가 가
	Type
	Fill
	Shape , ,
	color 가
	Zoom
	Undo
	Delete

. AutoDraw

AutoDraw

Keyboard Shortcuts			
ACTIONS		TOOLS	
Undo		Ctrl	Z
Redo	Shift	Ctrl	Z
Cut		Ctrl	X
Copy		Ctrl	C
Paste		Ctrl	V
Move	↑	←	↓ →
Send Back		[
Bring Front]	
Duplicate	Alt	DRAG	
AutoDraw	:	Autodraw	

활동 2 AutoDraw 활용하기

1. AutoDraw

가.

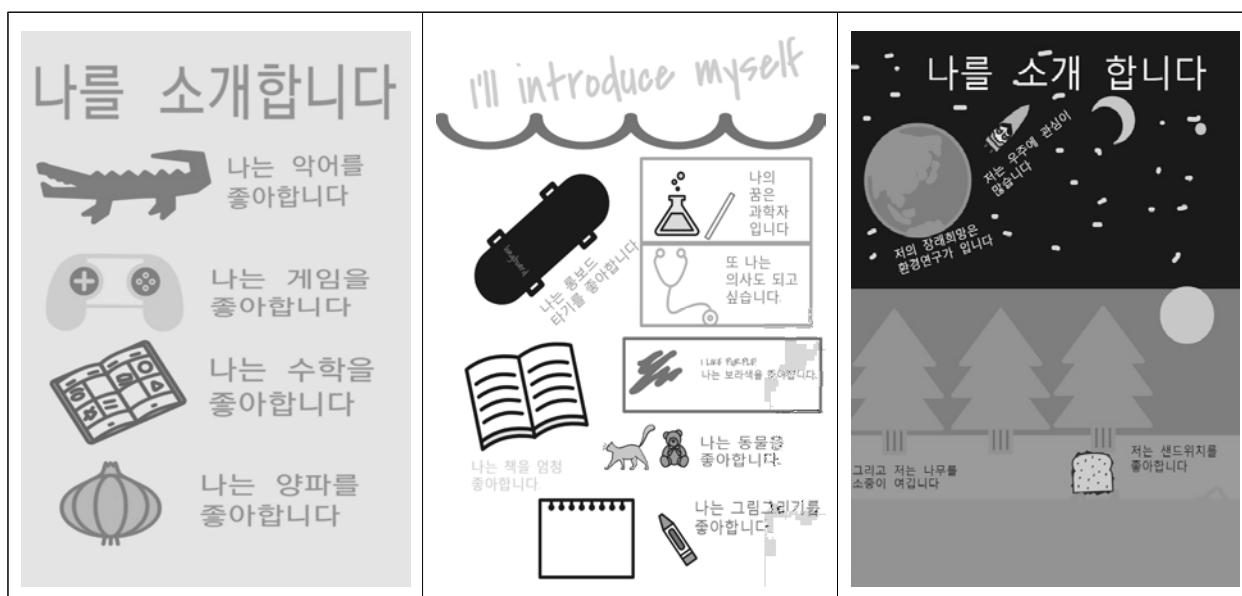
&

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AutoDraw

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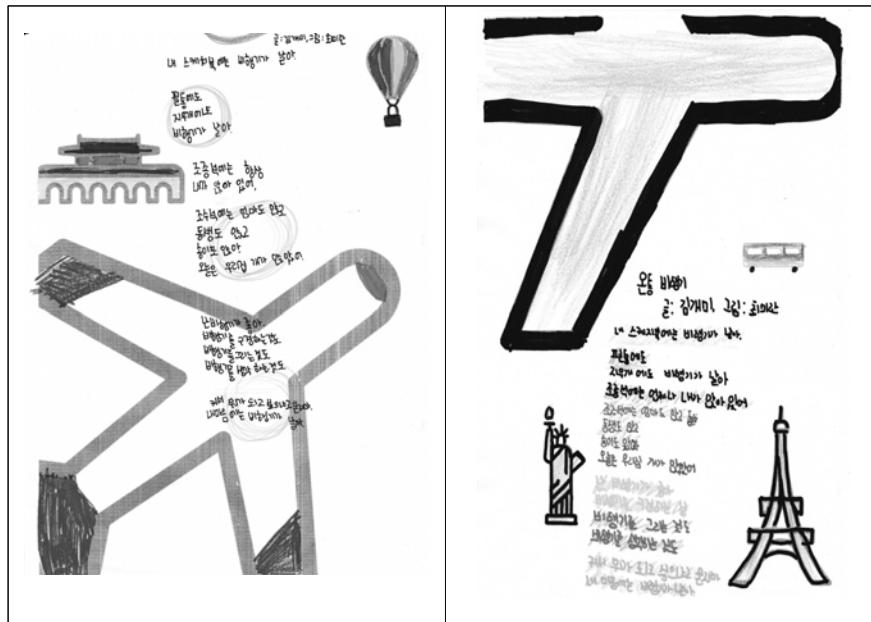


가

가

AutoDraw

AutoDraw



AutoDraw

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AutoDraw



활동

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디지털 영상지도 알아보기

1.

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가

1)

:

(GPS)

가

2)

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(<http://map.vworld.kr>)

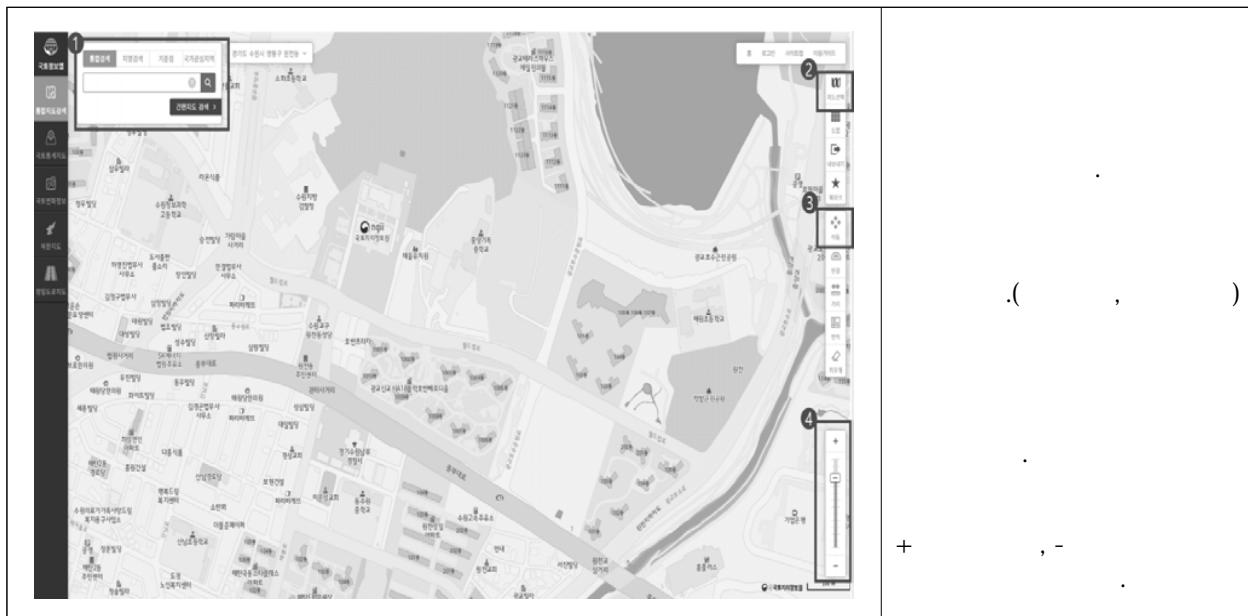
(<http://www.ngii.go.kr>)

(<http://map.naver.com>)

(<http://map.daum.net>)

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(Google Earth)

2005 6 28

• 3D

(<http://earth.google.com>) ,

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(GeoEye)'

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(Google Earth)

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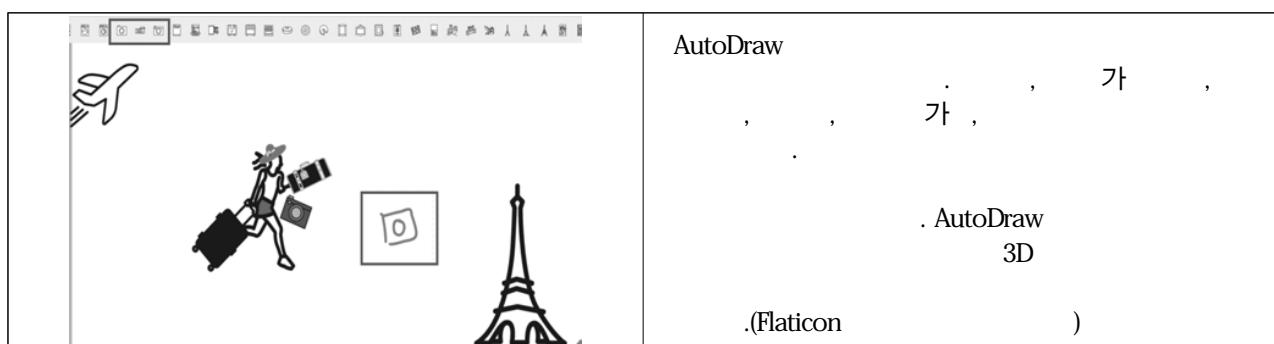
3D

Digitized by Google

활동 4 AutoDraw, 디지털영상지도를 활용한 관광홍보 자료 만들기

1. AutoDraw.

가. AutoDraw



(Google Earth)

가

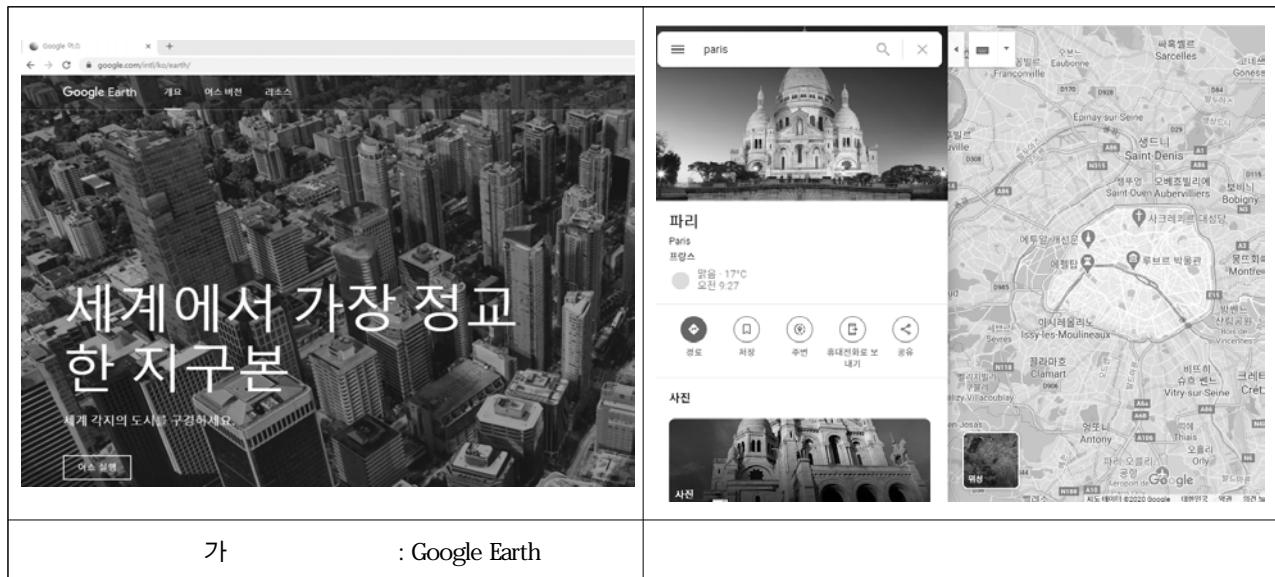
가

2D, 3D

3D

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가

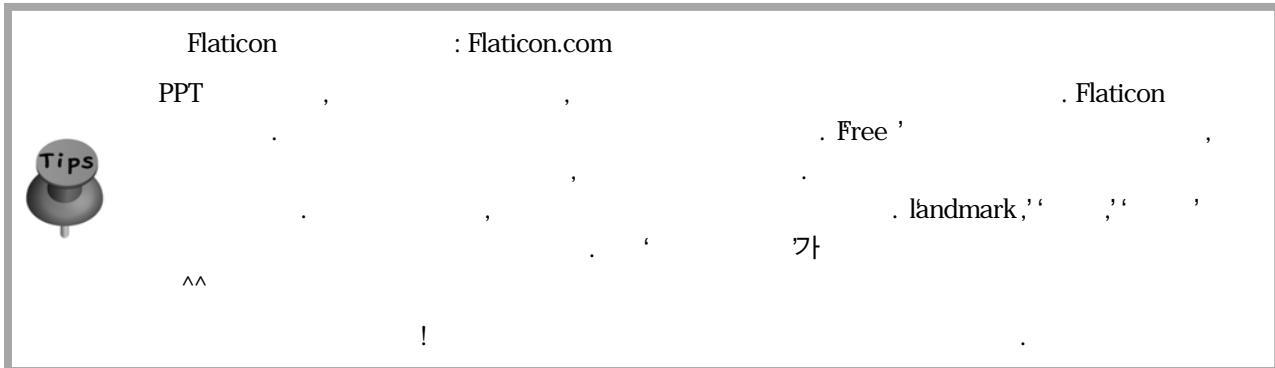


가 : Google Earth

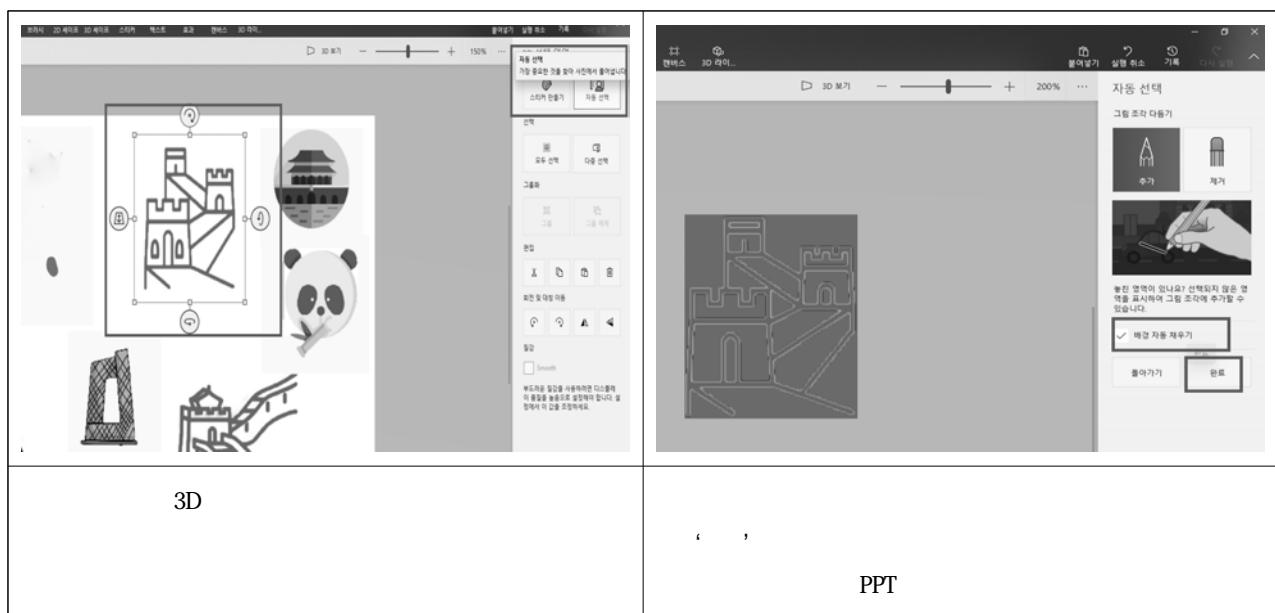
Flaticon

<p>flaticon.com</p>	<p>china</p>
	<p>!! www.flaticon.com ()가</p>

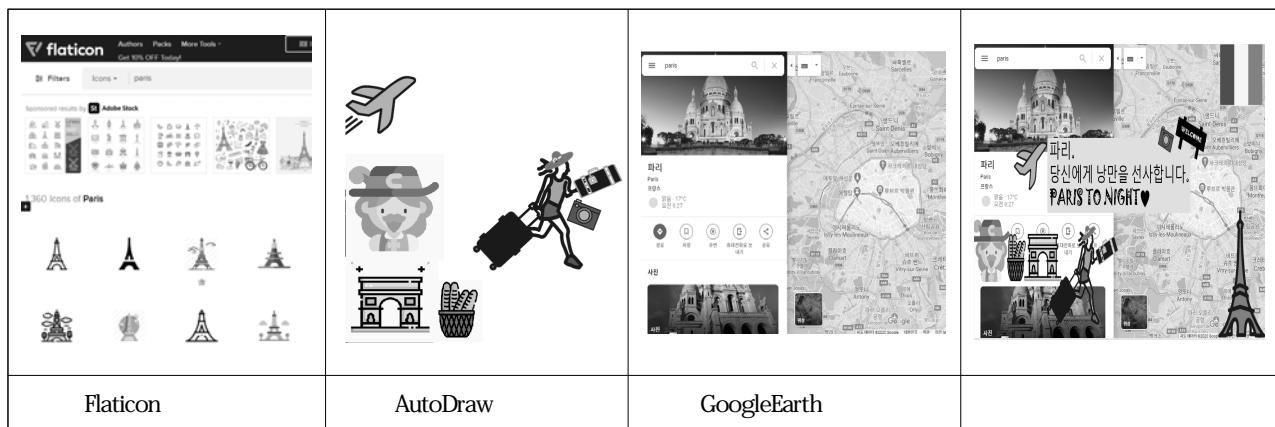
Autodraw



Flaticon : 3D



PPT



AutoDraw AutoDraw

Google Earth

Flaticon

PPT

, 3D

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Padlet

www.flaticon.com

Roundicons, Freepik

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Autodraw



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AutoDraw '

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할도

AutoDraw 이해하기

1. AutoDraw

가. AutoDraw ?

AutoDraw

. Fast Drawing for Everyone! ’

, Do you mean

• AutoDraw

Start over	
Download	
Share	
How-To	How-To AutoDraw
Shortcuts	Shortcuts AutoDraw
Artists	Artists AutoDraw
About	About AutoDraw

. AutoDraw

Select	
AutoDraw	가
Draw	가 가
Type	
Fill	
Shape	, ,
color	가
Zoom	
Undo	
Delete	

활동 2 AutoDraw 활용하기

1. AutoDraw

AutoDraw

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AutoDraw

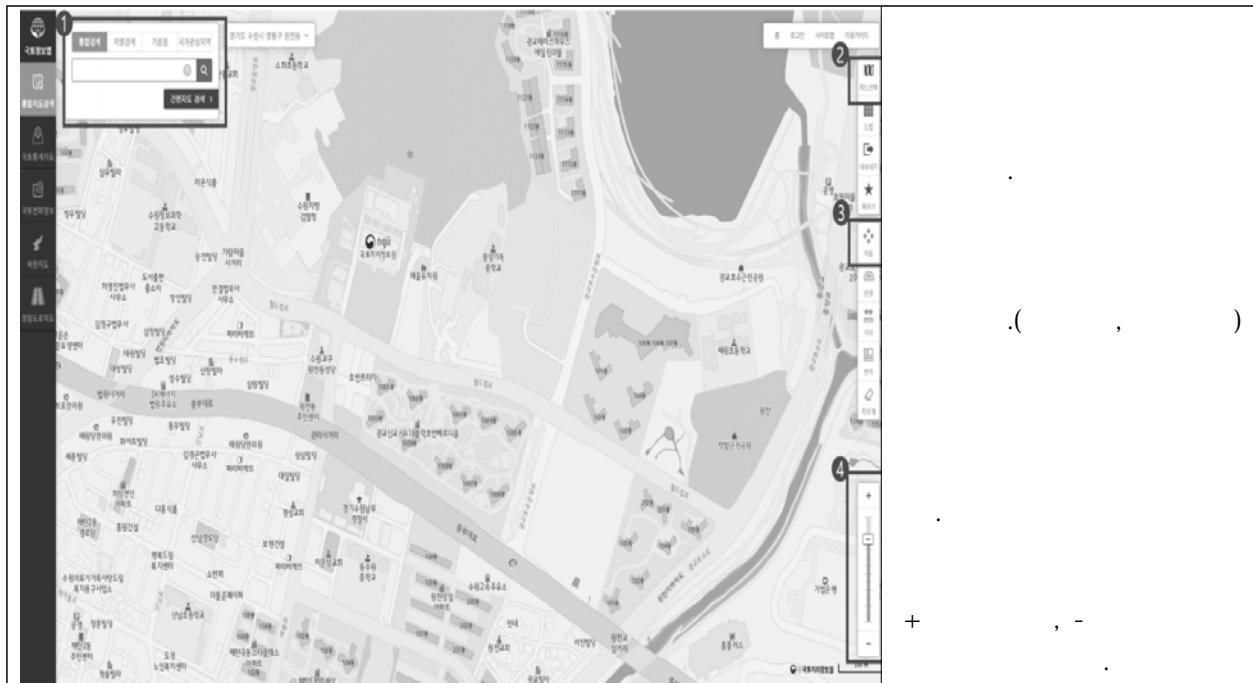
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활동 3 디지털 영상지도 알아보기

1.

가.

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(Google Earth)

(Google) 2005 6 28

(<http://earth.google.com>),

(Google Earth)

가,

가:

가

3D

가

: Google

가

활동

4

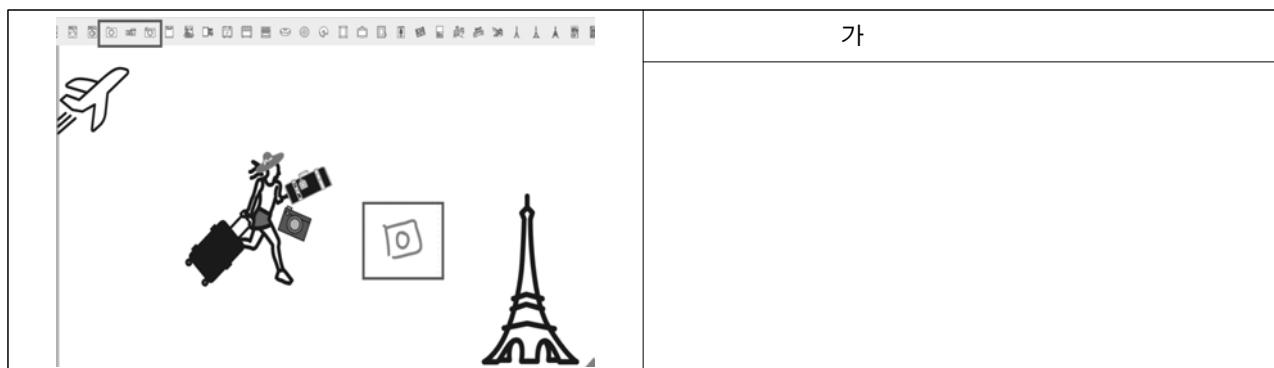
AutoDraw, 디지털영상지도를 활용한 관광홍보 자료 만들기

AutoDraw, Flaticon, GoogleEarth

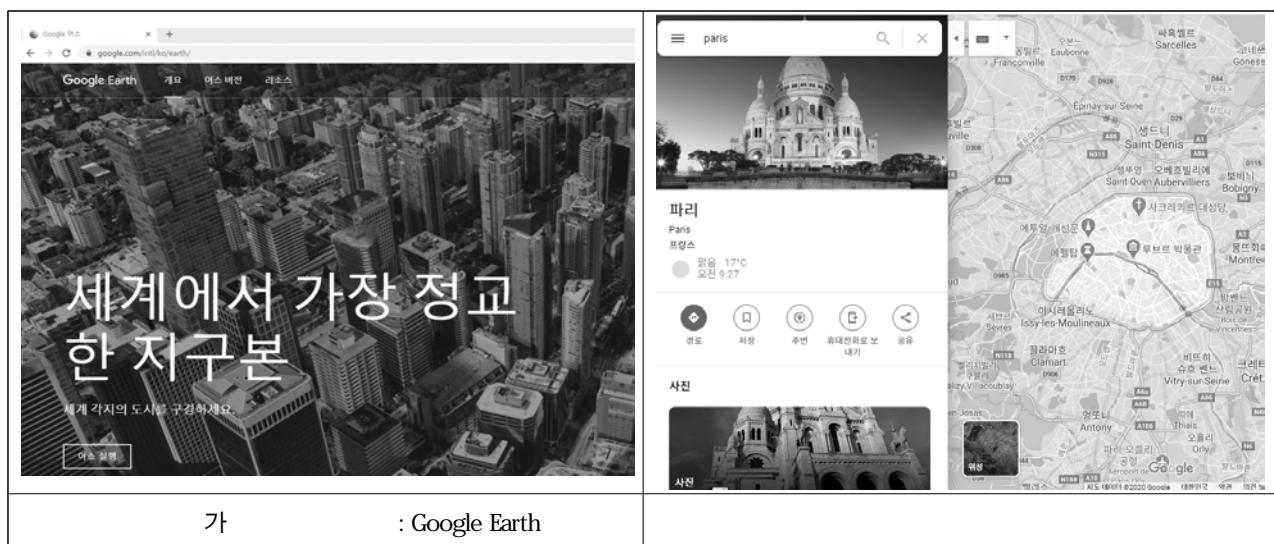


1. AutoDraw,

가. AutoDraw

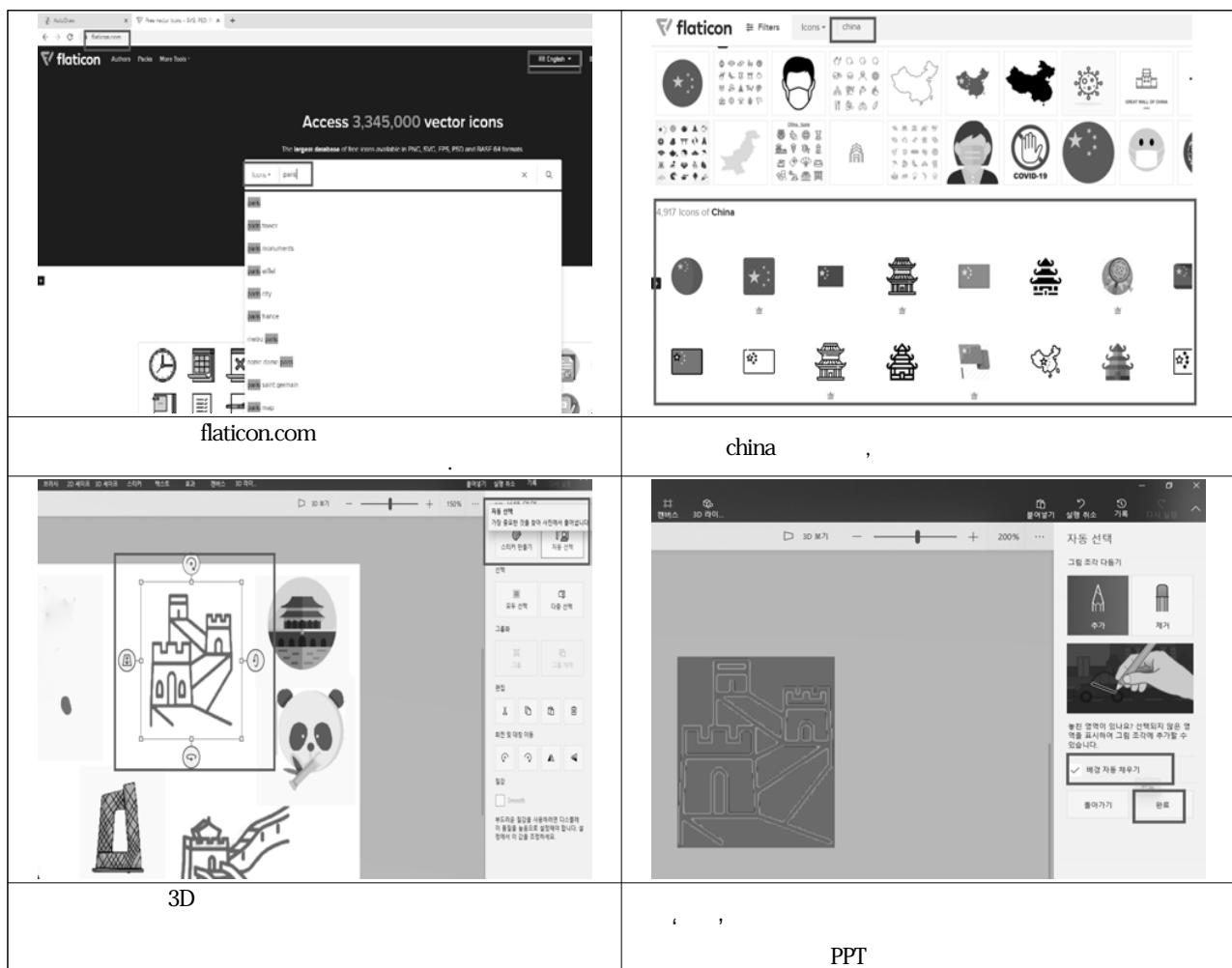


(Google Earth)

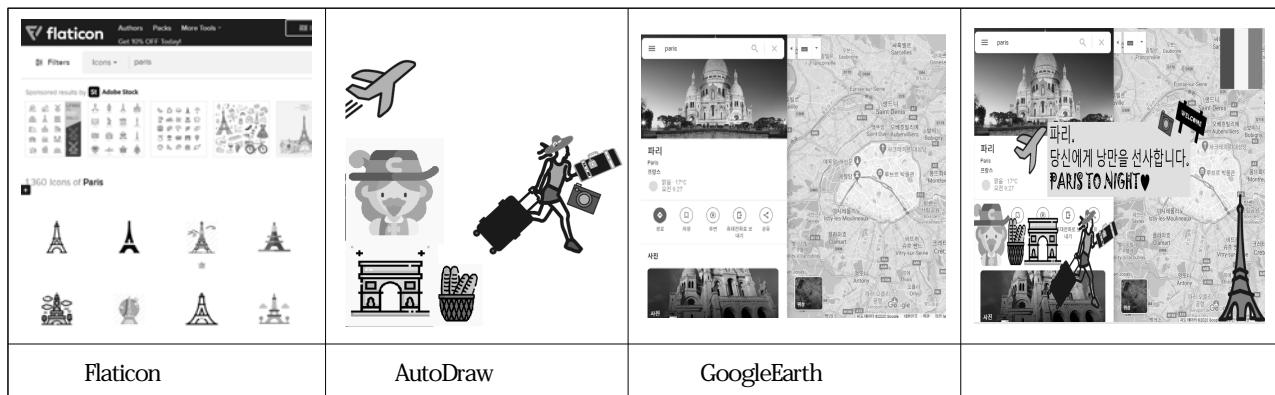




Flaticon : 3D



PPT



AutoDraw AutoDraw

Flaticon

Google Earth

PPT

, 3D

가





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발행일	2020. 11.