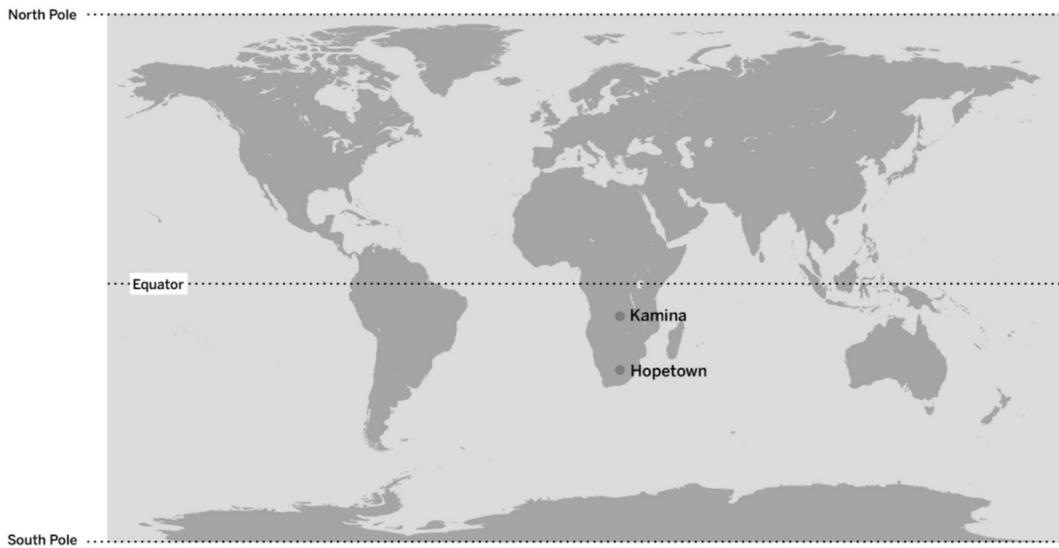


### Air Temperature in Christchurch

**Chapter Question:** What determines the air temperature of a location on Earth?

**Today's Objectives:** KWBAT analyze solar energy and ocean temperature data during normal years and El Niño years to determine the factors that affect air temperature in Christchurch

#### Do Now



1. "Hopetown is farther from the equator than Kamina. Which location has a colder air temperature and why?"

The most commonly picked **wrong** answer to the exit ticket from last class was "C":  
**"Hopetown, because less energy is transferred from the sun directly to the air."**

**Explain why this was the wrong answer.**

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#### Science Vocab:

- Equator or Poles
- Energy (more or less)
- Sun, Surface, Air

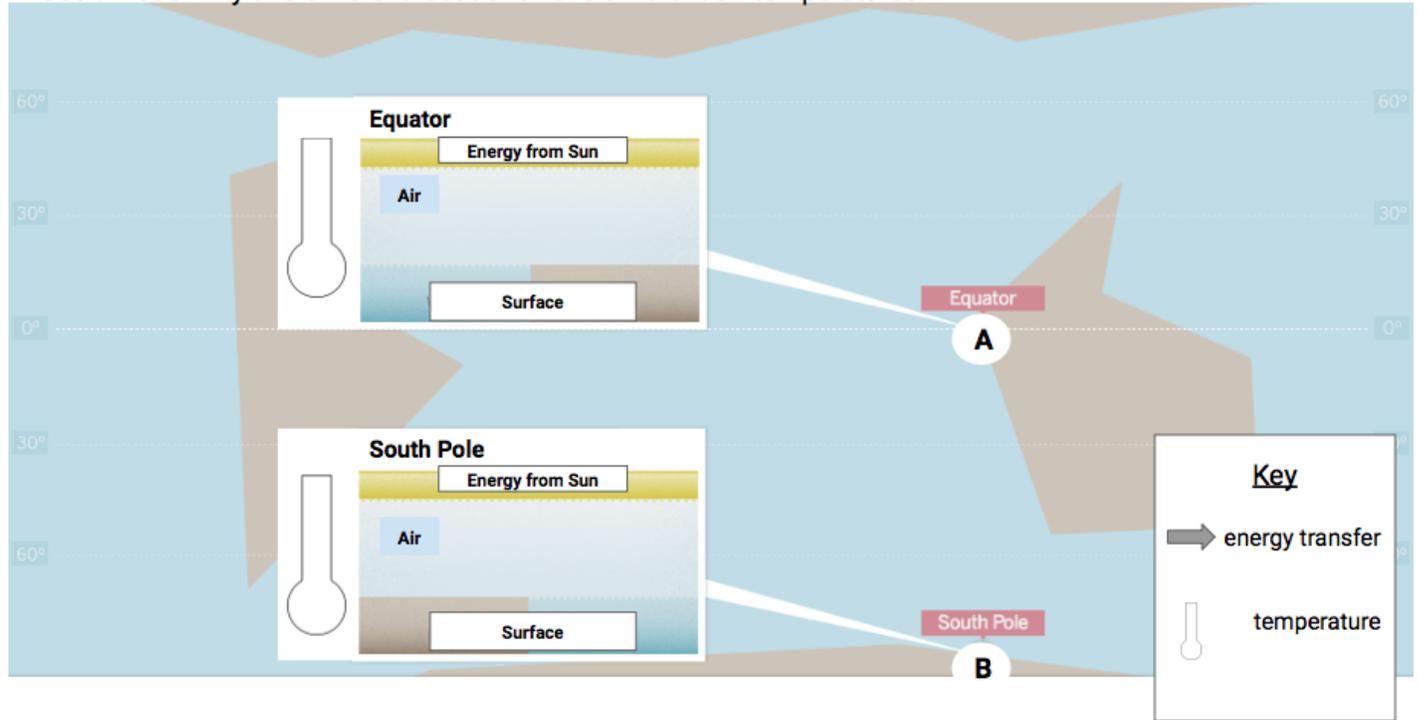
## Chapter 1 Task

### Model:

To complete the model:

1. Use arrows to represent how the air gets energy. (2 pts)
2. Fill in the thermometer to the left of each location to represent its approximate air temperature. (2 pt)
  - a. Use the energy labels so that they show what must be true about the energy at each location.

**Goal:** Model why two different locations have different air temperatures.



1. Which city is warmer? Explain what makes that city warmer than the other city. (4pts)

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### CFS:

- Answer in complete sentences.
- Vocabulary:
  - Temperature
  - Energy Transfer
  - Equator
  - Sun, Surface, Air

## Activity 1

Why is Christchurch, NZ's air temperature cooler than usual during El Niño years?

**Directions:** Review the question and then the three claims, and select the one that is the LEAST convincing.

Why is Christchurch, NZ's air temperature cooler than usual during El Niño years because... (Check one)

- Claim 1: The amount of energy from the sun changes.
- Claim 2: Something about Earth's surface (land or water) changes.
- Claim 3: Something about the air changes.

Explain why the claim you chose is the least convincing claim.

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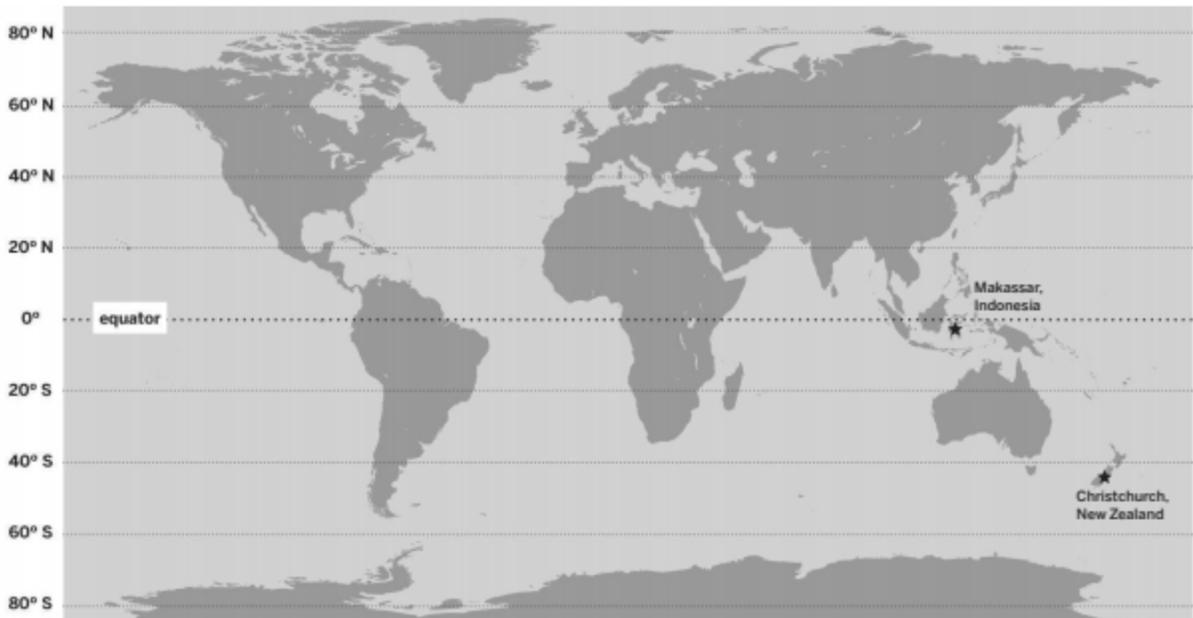
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### CFS

- CER
- Vocabulary: Temperature, Energy Transfer, Equator, Sun → Surface → Air
- Explain how latitude affects air temperature.
- Identify other factors that affect air temperature.

## Air Temperatures and Different Latitudes A

Location	Average air temperature
Christchurch, New Zealand	11°C (51.8°F)
Makassar, Indonesia	27.5°C (81°F)



**Prompt:** Why is the average air temperature of Makassar warmer than the average air temperature of Christchurch?

Add annotations to the map that will help you respond to the prompt. Write an explanation, using the evidence from the map and all these words: *energy, temperature, latitude, transfer*.

- Label the latitude on earth with the warmest temperatures.
- Label the latitude on earth with the coolest temperatures.

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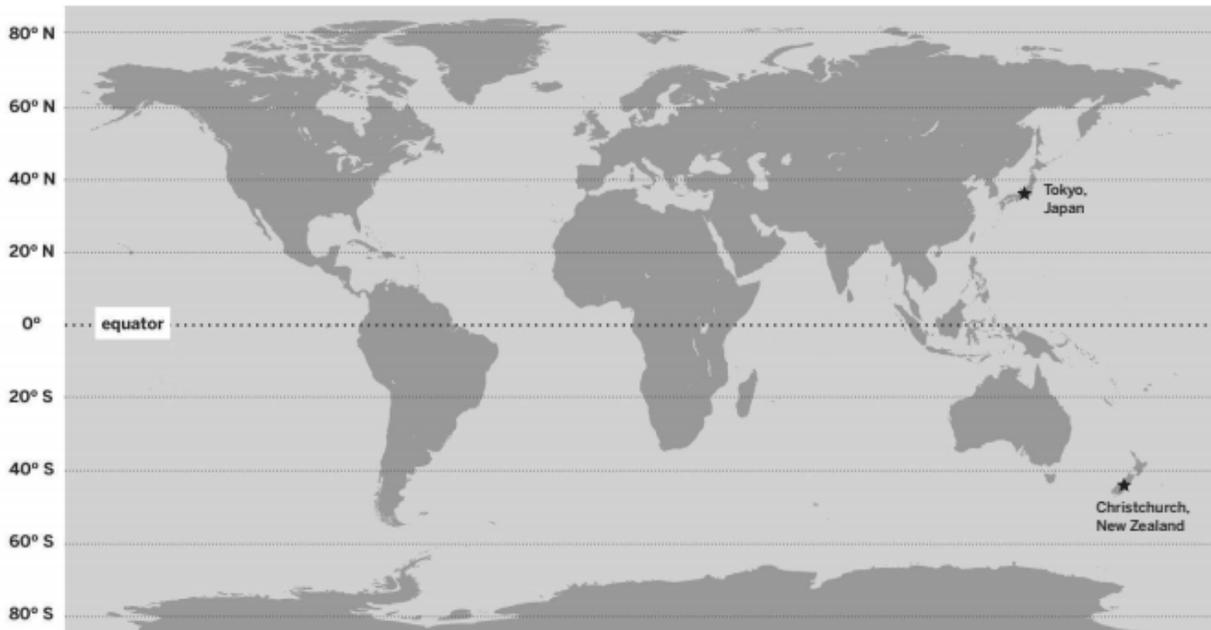
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## Air Temperatures and Different Latitudes B

Location	Average air temperature
Christchurch, New Zealand	11°C (51.8°F)
Tokyo, Japan	15.5°C (60°F)



**Prompt:** Why is the average air temperature of Tokyo warmer than the average air temperature of Christchurch?

Add annotations to the map that will help you respond to the prompt. Write an explanation, using the evidence from the map and all these words: *energy, temperature, latitude, transfer*.

- Label the latitude on earth with the warmest temperatures.
- Label the latitude on earth with the coolest temperatures.

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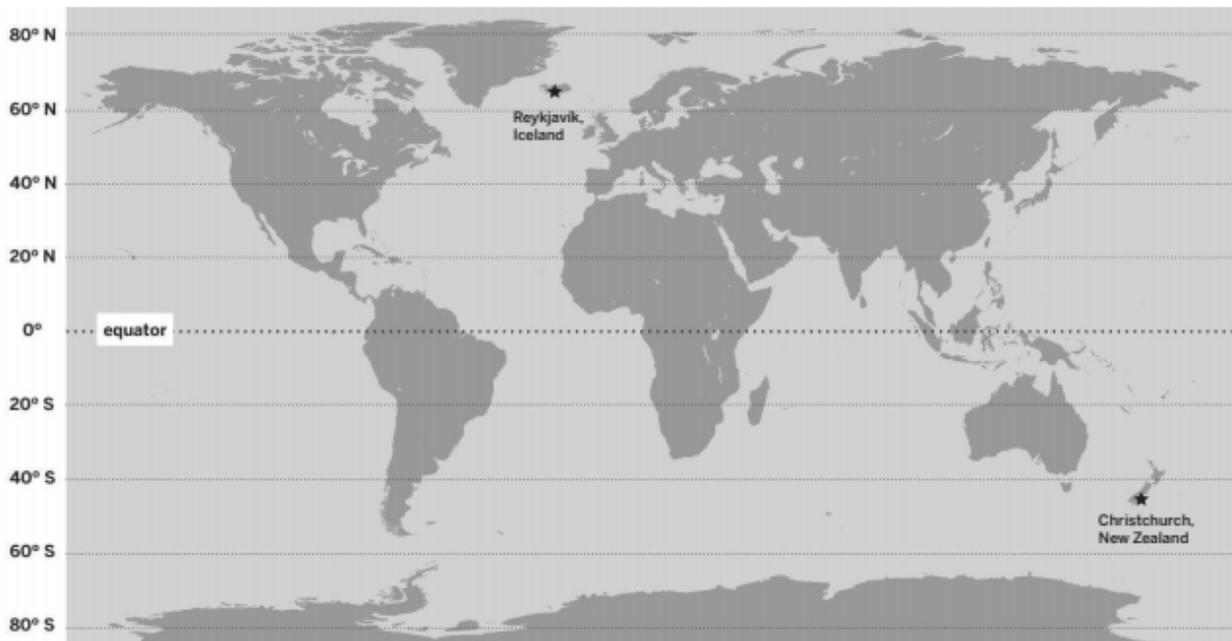
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## Air Temperatures and Different Latitudes C

Location	Average air temperature
Christchurch, New Zealand	11°C (51.8°F)
Reykjavik, Iceland	5.5°C (42°F)



**Prompt:** Why is the average air temperature of Reykjavik cooler than the average air temperature of Christchurch?

Add annotations to the map that will help you respond to the prompt. Write an explanation, using the evidence from the map and all these words: *energy, temperature, latitude, transfer*.

- Label the latitude on earth with the warmest temperatures.
- Label the latitude on earth with the coolest temperatures.

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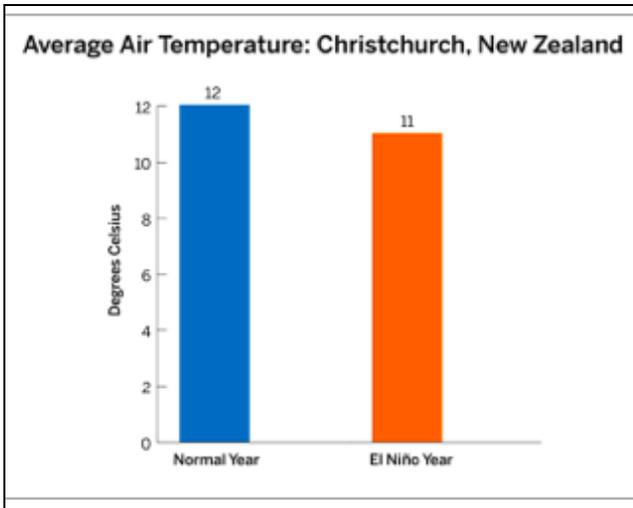
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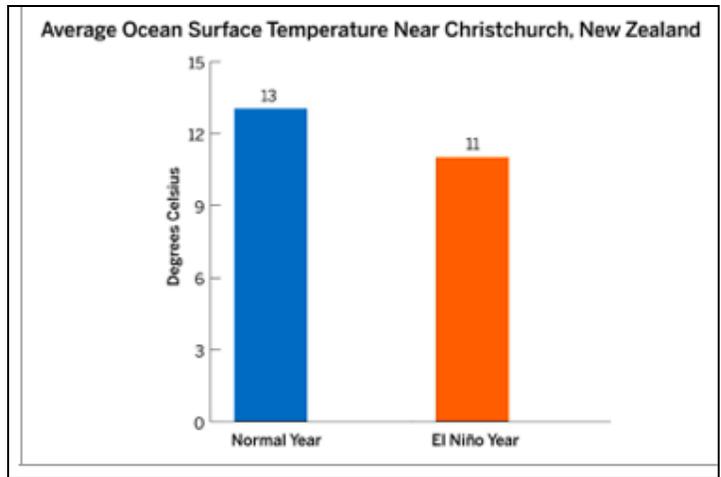
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## Analyzing Data About Christchurch

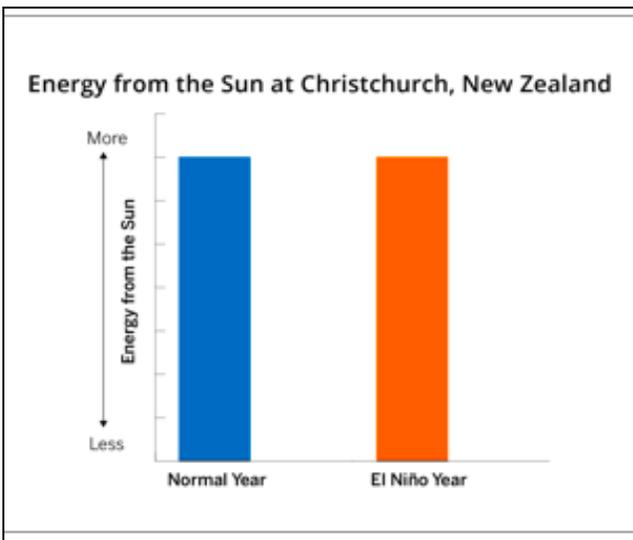
Graph A.



Graph B.



Graph C.



CFU:

1. What information does graph A show us?

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2. What information does graph B show us?

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3. What information does graph C show us?

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4. Does graph C help us explain why the air temperature of Christchurch is cooler during El Niño years? Explain your reasoning.

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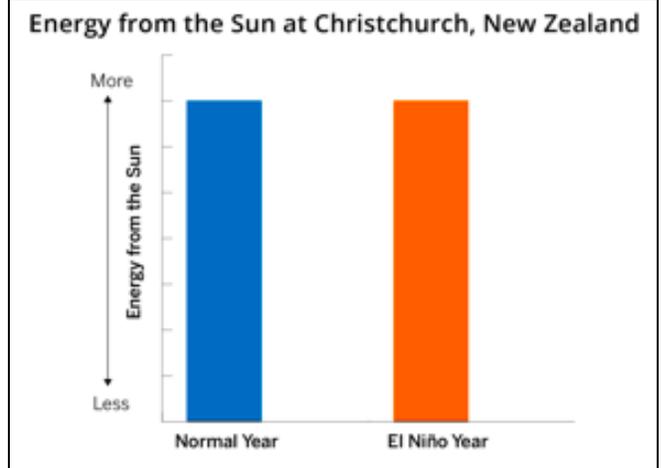
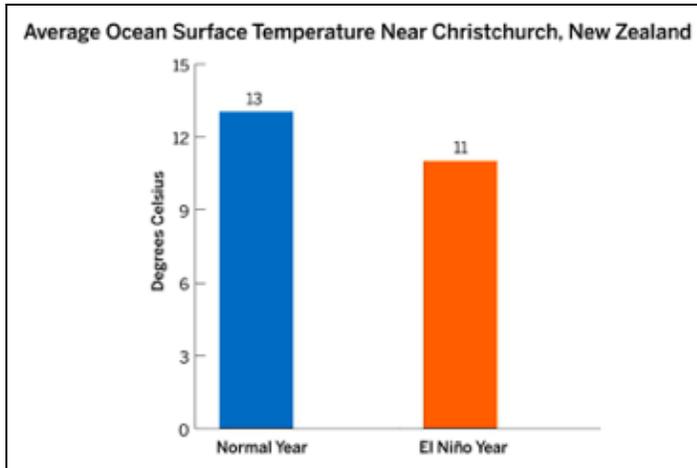
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5. Which graph best explains why the air temperature of Christchurch is cooler during El Niño years? Explain your reasoning.

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## Data About Christchurch Open Ended Response



1. Which of the following graphs best supports the claim; ***Energy from the sun is not the only factor that determines the air temperature in a location?*** (circle one)

- A. Graph 1: "Average Ocean Surface"
- B. Graph 2: "Energy from the Sun"

2. What evidence in the graph you picked supports the claim.

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3. Explain why the other graph ***does not*** support the claim.?

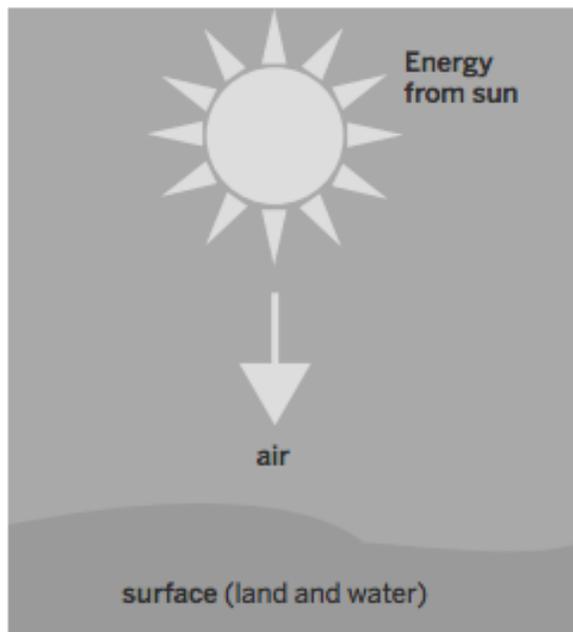
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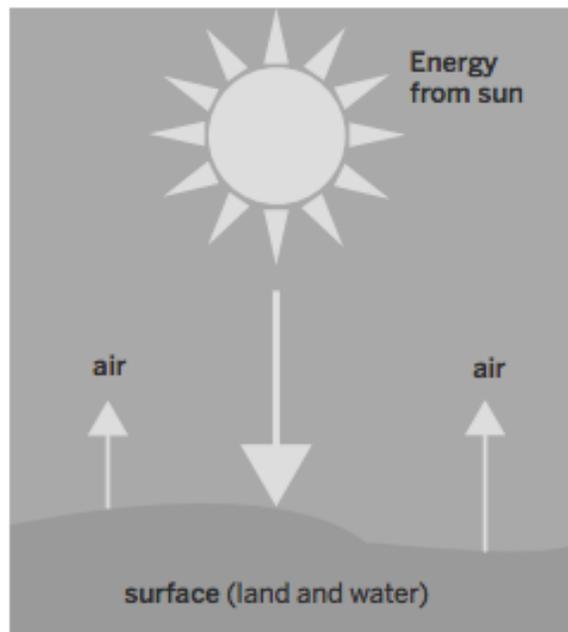
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## EXIT TICKET

**Investigation Question:** *How does air get energy?*



**Claim 1:** Energy is transferred from the sun to the air.



**Claim 2:** Energy is transferred from the sun to the surface, and then to the air.

1. Parker tells you that in Alaska energy is transferred from the sun to the air and that's why it's so cold. "Claim 1". Is Parker correct and why?
- Parker is correct because more energy is transferred from Sun to Air making it colder there.
  - Parker is correct because less energy is transferred from Sun to Air making it colder there.
  - Parker is incorrect because more energy is transferred from Sun to Surface to Air making it colder there.
  - Parker is incorrect because less energy is transferred from Sun to Surface to Air making it colder there.

### CFS:

- Annotate the Diagram/Question
- Rephrase the Question
- Make a Prediction
- Use Scrap Paper
- Choose the Best Answer

# The Sims

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

- WHIMS
- SKILLS
- GRILLED CHEESE
- URBZ
- WOOHOO
- FREEZER BUNNY
- CAREERS
- TRAGIC CLOWN
- ASPIRATIONS
- MEDIEVAL
- KACHING
- FREE PLAY
- ROSEBUD
- PLUMBOB
- SPLINES
- LLAMA
- ALIENS
- GNOMES

# The Addams Family

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

- HOMER
- PUGSLEY
- EYE OF NUTE
- GOMEZ
- MORTICIA
- GRANDMAMA
- SPIDER
- TOADSTOOL
- GOTH
- WEDNESDAY
- SPOOKY
- BATS
- BLACK
- CREEPY
- LURCH
- FAMILY
- ADDAMS
- UNCLE FESTER
- FRUMP