Learning Activities

Grade 6

Suggested Learning Activities for Grade 6 students during the COVID-19 school closure.

Seattle Public Schools is committed to making its online information accessible and usable to all people, regardless of ability or technology. Meeting web accessibility guidelines and standards is an ongoing process that we are consistently working to improve.

While Seattle Public Schools endeavors to only post documents optimized for accessibility, due to the nature and complexity of some documents, an accessible version of the document may not be available. In these limited circumstances, the District will provide equally effective alternate access.

Due to the COVID-19 closure, teachers were asked to provide packets of home activities. This is not intended to take the place of regular classroom instruction but will help supplement student learning and provide opportunities for student learning while they are absent from school. Assignments are not required or graded. Because of the unprecedented nature of this health crisis and the District’s swift closure, some home activities may not be accessible.

If you have difficulty accessing the material or have any questions, please contact your student’s teacher.
Middle School
Math Grade 6

Topic 6
Lesson 6-1 & 6-2

Understand and Use Percent
How to Access & Use Pearson Bounce Pages

The Bounce Page app is a place where you can access Virtual Nerd videos. These are interactive tutorial videos that go over the fundamental math concepts of each lesson.

You can download Pearson Bounce Pages from your Android or Apple store.

**TIPS FOR USING BOUNCE PAGE**

1. **AIM** the camera so the FULL page is easily viewable on your screen. For best results, flatten the page, or if scanning a screen be sure the entire page is visible on your phone screen.

2. **TAP** the screen to scan the entire front of the page. Scan the ENTIRE page. Scanning a single problem will not work. Scan the page BEFORE students write on the page.

3. **BOUNCE** the page to life by clicking your Bounce Pages program icon.

4. Update the operating system on your device and the Bounce Pages app as needed.
A percent is a rate in which the first term is compared to 100. The 100 represents 1 whole. The first term tells what part of 100 a quantity is. The word percent means “for each 100.”

\[
\frac{41}{100} = 41\% \\
18\% = \frac{18}{100} \\
\frac{99}{100} = 99\% \\
31\% = \frac{31}{100}
\]

1. In a survey of 5 people, 3 said they prefer bananas over apples.

   The number line shows the number of people surveyed. Draw a point on the number line to show the number of people who preferred bananas.

2. Complete the number line to 100 by labeling the tick marks between 0 and 100. Draw a point at the same position that you did on the number line above.

3. What percent of the people in the survey preferred bananas? _____

4. The circle below has _____ parts, and _____ parts are shaded.

5. What fraction represents the shaded part of the diagram? _____

6. Write an equivalent fraction with a denominator of 100. _____

7. What percent of the diagram is shaded? _____

On the Back!

8. Write the percent of the figure that is shaded.
6-1 Additional Practice

In 1–3, write the percent of each figure that is shaded.

1.

2.

3.

In 4–6, shade each model to represent the given percent.

4. 3%

5. 80%

6. 30%

7. Jana divided a sheet of paper into 5 equal sections and colored 2 of the sections red. What percent of the paper did she color?

8. Model with Math Water makes up about 60% of the average adult’s body weight. Represent this percent by shading in the squares. (MP4)

9. Reasoning Kelly saved $150. That is 50% of the money she earned this summer. How much did Kelly earn this summer? (MP2)

10. When students were asked to name their favorite type of music, 3 out of every 5 students chose rock music. What percent of the students chose another type of music?
In 11 and 12, use the line segment.

11. If \( BC \) represents 200%, what is the length of a line segment that is 75%? Explain.

12. If \( BC \) represents 10%, what is the length of a line segment that is 100%? Explain.

In 13–15, use the diagram at the right.

13. Make Sense and Persevere Ally wants to tile her laundry room floor with checkered ceramic tiles as shown. What percent of Ally’s floor will be white? \( \text{MP.1} \)

14. Higher Order Thinking Ally buys a box of blue tiles that will cover 18 ft\(^2\). What percent of the floor can she tile using this box? Does Ally need to buy another box of blue tiles? Explain.

15. There are 25 white tiles in a box. What percent of the tiles will Ally use to tile her laundry room floor?

Assessment Practice

16. Select all the figures that are shaded to represent 75% of the whole.
A percent is a rate in which the first term is compared to 100. The 100 represents 1 whole. The first term tells what part of 100 a quantity is. The word percent means "for each 100."

\[
\begin{align*}
11 & \quad 1100 = 11\% \\
18 & \quad 1800 = 18\% \\
99 & \quad 9900 = 99\% \\
31 & \quad 3100 = 31\%
\end{align*}
\]

1. In a survey of 5 people, 3 said they prefer bananas over apples. The number line shows the number of people surveyed. Draw a point on the number line to show the number of people who prefer bananas.

\[
\begin{align*}
0 & \quad 1 \quad 2 \quad 3 \quad 4 \quad 5
\end{align*}
\]

2. Complete the number line to 100 by labelling the tick marks between 0 and 100. Draw a point at the same position that you did on the number line above.

\[
\begin{align*}
0 & \quad 20 \quad 40 \quad 60 \quad 80 \quad 100
\end{align*}
\]

3. What percent of the people in the survey preferred bananas? 60%

4. The circle below has 10 parts, and 7 parts are shaded.

5. What fraction represents the shaded part of the diagram? \[\frac{7}{10}\]

6. Write an equivalent fraction with a denominator of 100. \[\frac{70}{100}\]

7. What percent of the diagram is shaded? 70%

On the Back!

8. Write the percent of the figure that is shaded. 30%

In 11 and 12, use the line segment.

11. If \( BC \) represents 200%, what is the length of a line segment that is 75%? Explain.

12. If \( DE \) represents 10%, what is the length of a line segment that is 100%? Explain.

13. Make Sense and Persevere. Ally wants to tile her laundry room floor with checkered ceramic tiles as shown. What percent of Ally's floor will be white? 50%

14. Higher Order Thinking. Ally buys a box of blue tiles that will cover 18 ft². What percent of the floor can she tile using this box? Does Ally need to buy another box of blue tiles? Explain.

15. There are 25 white tiles in a box. What percent of the tiles will Ally use to tile her laundry room floor? 33%

Assessment Practice

16. Select all the figures that are shaded to represent 75% of the whole.
A fraction is a number that can describe parts of a whole.

If the fraction $\frac{7}{10}$ describes the shaded portion of a circle, then the whole circle has 10 equal parts and 7 of them are shaded.

A decimal can also describe parts of a whole.

The fraction $\frac{7}{10}$ can be written as the decimal 0.7. The fraction $\frac{85}{100}$ can be written as the decimal 0.85.

The diagram shows how Roscoe, Ariana, and Fujita shared a pizza. Roscoe ate 0.25 of the pizza, Ariana ate $\frac{1}{8}$ of the pizza, and Fujita ate 50% of the pizza.

1. Fill in the boxes to write 0.25 as a fraction and as a percent.

   Fraction: $0.25 = \frac{\square}{100} = \frac{25}{100} \div 25 = \frac{1}{\square}$

   Percent: $0.25 = \frac{25}{\square} = \square \%$

2. Fill in the boxes to write $\frac{1}{8}$ as a decimal and as a percent.

   Decimal: $\frac{1}{8} = \frac{1 \times \square}{8 \times 12.5} = \frac{\square}{100} = \square$

   Percent: $0.125 = \frac{125}{\square} = \frac{125 \div 10}{\div 10} = \frac{\square}{100} = \square \%$

3. Fill in the boxes to write 50% as a fraction and as a decimal.

   Fraction: $50\% = \frac{\square}{100} = \frac{\square \div \square}{\div \square} = \frac{1}{\square}$

   Decimal: $50\% = \frac{50}{\square} = \square$

On the Back!

4. Write 0.78 as a fraction and as a percent.
6-2  Additional Practice

In 1–9, write each number in two equivalent forms as a fraction, a decimal, or a percent.

1. 0.24  
2. \( \frac{2}{100} \)  
3. 16%

4. 0.43  
5. 18%  
6. \( \frac{1}{8} \)

7. \( \frac{1}{4} \)  
8. 5%  
9. \( \frac{3}{8} \)

In 10–15, use the circle graphs.

10. **Reasoning** What decimal shows the combined portion of boys who like pop and country music? [MP.2]

11. What type of music did \( \frac{1}{5} \) of the girls choose as their favorite?

12. Which types of music are the favorites for the most boys? Write the percent of each as a fraction.

13. Which type of music is the least favorite music for the girls? What is that percent as a decimal?

14. Which two types of the girls’ favorite music combined represent 0.45? Write each percent as a fraction.

15. Which types of music are the boys’ least favorite? Write each percent as a fraction and a decimal.
16. Two out of every 5 customers at a restaurant use cash to pay for their meal. What percent of the customers pay with cash?

17. Enrollment in French class at a high school is 0.72 of enrollment in Spanish class. What is enrollment in French class compared to Spanish class as a fraction and as a percent?

18. **Reasoning** Write $\frac{9}{12}$ as a decimal and as a percent. Describe two ways to find the answer. **MP2**

19. **Critique Reasoning** Sixty percent of the students in Zachary's class ride their bikes to school. Zachary says that $\frac{6}{10}$ of the students ride their bikes to school. Is he right? Explain. **MP3**

20. Ramon played in 0.7 of his team's basketball games this season. What percent of the games did Ramon play?

21. Nancy recorded 8 movies on her DVR. She watched 5 of the movies. What percent of the movies did Nancy watch?

22. Shelly sold $\frac{8}{25}$ of the total number of raffle tickets for a fundraiser. Write this fraction as a decimal and as a percent.

23. **Higher Order Thinking** Three classes have the same number of students. The teachers compared attendance on one Friday. Mr. Lopez had 92.5% of his students in class. Mrs. Foster had $\frac{19}{20}$ of her students in class. In Ms. Kelly's class, 0.9 of the students were present. Which teacher had the most students in class that Friday?

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**Assessment Practice**

In 24 and 25, draw lines to match each fraction, decimal, or percent on the right to the equivalent fraction, decimal, or percent on the left.

24. $\frac{7}{25}$  
8%  
$\frac{3}{5}$  
$\frac{22}{50}$  
60%  
0.44  
$\frac{2}{25}$  
28%

25. $\frac{4}{25}$  
6%  
0.1  
$\frac{7}{8}$  
0.06  
0.16  
10%  
0.875
A fraction is a number that can describe parts of a whole. If the fraction \( \frac{2}{5} \) describes the shaded portion of a circle, then the whole circle has 10 equal parts and 7 of them are shaded.

A decimal can also describe parts of a whole. The fraction \( \frac{2}{5} \) can be written as the decimal 0.4. The fraction \( \frac{3}{8} \) can be written as the decimal 0.375.

The diagram shows how Roscoe, Ariana, and Fujita shared a pizza. Roscoe ate \( \frac{1}{5} \) of the pizza, Ariana ate \( \frac{2}{5} \) of the pizza, and Fujita ate 50% of the pizza.

1. Fill in the boxes to write 0.25 as a fraction and as a percent.
   
   Fraction: \( 0.25 = \frac{25}{100} = \frac{1}{4} \)
   
   Percent: \( 0.25 = 25\% \)

2. Fill in the boxes to write \( \frac{1}{8} \) as a decimal and as a percent.
   
   Decimal: \( \frac{1}{8} = 0.125 \)
   
   Percent: \( 0.125 = 12.5\% \)

3. Fill in the boxes to write 50% as a fraction and as a decimal.
   
   Fraction: \( 50\% = \frac{50}{100} = \frac{1}{2} \)
   
   Decimal: \( 50\% = 0.5 \)

On the Back!

4. Write 0.78 as a fraction and as a percent.
   
   \( 0.78 = \frac{78}{100} = 78\% \)

5. Two out of every 5 customers at a restaurant use cash to pay for their meal. What percent of the customers pay with cash? 40%.

6. Reasoning. Write \( \frac{2}{3} \) as a decimal and as a percent. Describe two ways to find the answer. \( \frac{2}{3} = 0.67 \approx 67\% \).

7. In 10-15, use the circle graphs.

   10. Reasoning. What decimal shows the combined portion of boys who like pop and country music? 0.75.

   11. What type of music did \( \frac{1}{4} \) of the girls choose as their favorite? Country.

   12. Which types of music are the favorites for the most boys? Write the percent of each as a fraction. Hip-Hop and R&B. Sample answer: \( \frac{1}{10} \).

   13. Which type of music is the least favorite music for the girls? What is that percent as a decimal? Rock, 0.05.

   14. Which two types of the girls’ favorite music combined represent 0.45? Write each percent as a fraction. Hip-Hop and Country. Sample answer: \( \frac{9}{20} \).

   15. Which types of music are the boys’ least favorite? Write each percent as a fraction and a decimal. Country and Pop. Sample answer: Country \( \frac{11}{20} \), Pop \( \frac{1}{10} \).

Assessment Practice

In 24 and 25, draw lines to match each fraction, decimal, or percent on the right to the equivalent fraction, decimal, or percent on the left.

24. \( \frac{1}{2} = 0.5 = 50\% \)

25. \( \frac{3}{4} = 0.75 = 75\% \)

16. Enrollment in French class at a high school is 0.32 of enrollment in Spanish class. What is enrollment in French class compared to Spanish class as a fraction and as a percent? \( \frac{8}{25} \) or 32%.

19. Critique Reasoning. Forty percent of the students in Zachary’s class ride their bikes to school. Zachary says that \( \frac{2}{5} \) of the students ride their bikes to school. Is he right? Explain. Yes; Sample answer: 0.40 is equivalent to \( \frac{2}{5} \) and \( \frac{2}{5} \) is equivalent to \( \frac{2}{5} \).

20. Ramon played in 0.7 of his team’s basketball games this season. What percent of the games did Ramon play? 70%.

21. Nancy recorded 8 movies on her DVR. She watched 5 of the movies. What percent of the movies did Nancy watch? 62.5%.

22. Shehla sold \( \frac{3}{10} \) of the total number of raffle tickets for a fundraiser. Write this fraction as a decimal and as a percent. 0.3, 30%.

23. Higher Order Thinking. Three classes have the same number of students. The teachers compared attendance on one Friday. Mr. Lopez had 92% of his students in class. Mrs. Foster had \( \frac{19}{20} \) of her students in class. In Ms. Kelly’s class, 0.9 of the students were present. Which teacher had the most students in class that Friday? Mrs. Foster had the most students with 95% attendance.
Lesson 7: Explaining the Change in Air Temperature in Christchurch
Hello Families,

We hope you and your family are well and safe during this time. During this unprecedented out-of-school time, the SPS middle school science team will be offering instructional opportunities for students that align with the district’s adopted middle school science instructional materials.

This investigation packet is part of a series of district-aligned lessons for middle school science developed by AmplifyScience and adopted by SPS in 2019. While Amplify Science lessons are designed to be done in the classroom with peers, there are some activities that students can complete at home.

In this packet you will find activities to accompany the lesson videos being aired this week through Seattle’s Public television programming on SPS TV (local channel 26). The videos and packets are also posted to the, SPS Science webpage under their corresponding grade level. These lesson videos, developed in collaboration between SPS teachers, Denver Public Schools teachers, and Amplify Science, feature teachers going through the information in the lessons. The work in this packet is intended to be completed alongside the viewing of the video of the corresponding videos.

Closed captioning for the videos is available many home languages if this helpful to your family.

- Click CC (bottom right of video)
- Click Setting (the gear next to CC)
- Click Subtitles/CC
- Click Auto-translate
- Choose your language

For students who have access to the internet and the following devices and browsers may wish to log-in to their AmplifyScience account from home are welcome to do so. Chrome and Safari are the recommended browsers to use for full functionality of the Amplify digital tools and features.

Sincerely,
Seattle Public Schools Science Department
Hello SPS Indian families,

We hope you and your family are well during this time. During this unprecedented period away from school, SPS' middle school science team will offer instruction opportunities for students, which align with the district's middle school science instruction materials.

This learning package is part of a series of remote extra-curricular lessons aligned with the district, developed by AmplifyScience. Although Amplify Science lessons are designed for peer instruction in the classroom, students can complete some activities at home. In this package, you will find activities to accompany the videos of the lessons that will be broadcast this week through Seattle Public Television's program (local channel 26). Videos and learning packages will also be posted on the SPS website, https://www.seattleschools.org/academics/curriculum/science.

If helpful, SPS can provide video subtitles in several languages.

○ Click CC (video right bottom corner)
○ Click Setting (CC on the side齿轮)
○ Click Subtitles/CC
○ Click Auto-translate
○ Choose your language

You can access the internet as long as you have the following devices and browsers. Students can log into their AmplifyScience accounts at home.

○ Desktops and Laptops (Chrome & Safari)
○ Chromebooks
○ iPads that support iOS11.3+ (iPad5+) - Suggested browser: Safari

If you have questions, please contact us.

Sincerely,

Seattle Public Schools Science Department

SPANISH

Hola Familias de Secundaria de las Escuelas Públicas de Seattle,

Esperamos que usted y su familia estén bien y seguros durante esta temporada. Durante este tiempo sin precedentes fuera de la escuela, el equipo de ciencias de la escuela secundaria de SPS ofrecerá oportunidades de instrucción para los estudiantes, que se alinean con los materiales de instrucción de ciencias de la escuela secundaria adoptados por el distrito.

Este paquete de investigación es parte de una serie de lecciones extraescolares remotas alineadas con el distrito, desarrolladas por AmplifyScience. Si bien las lecciones de Amplify Science están diseñadas para realizarse en el aula con sus compañeros, hay algunas actividades que los estudiantes pueden completar en casa. En este paquete encontrarás actividades para acompañar los videos de las lecciones que se transmiten esta semana a través de la programación de televisión pública de Seattle en SPS TV (canal local 26). Los videos y puentes también se publican en la página web de SPS, https://www.seattleschools.org/academics/curriculum/science.
Trành trí, giáo dục thường ngày nên diều chỉnh để giúp ích cho gia đình của quý vị.

- Nhập CC (đấu riêng bên phải của video)
- Nhập vào Setting (biết tương hình bán kính bên cạnh CC)
- Nhập vào Subtitles/CC
- Nhập vào Auto-translate
- Chọn ngôn ngữ của quý vị

Học sinh nào truy cập vào internet và các thiết bị và trình duyệt sau có thể đăng nhập vào tài khoản AmplifyScience của các em từ nhà.

- Desktops and Laptops (Chrome & Safari)
- Chromebooks
- iPads that support iOS11.3+ (iPad5+) - Suggested browser: Safari

Trành trí,
Seattle Public Schools Science Department
Lesson 7
You are close to completing your investigation into why Christchurch’s air temperature is cooler than usual during El Niño years. In this lesson, you will use the Sim to investigate how changes to prevailing winds can affect the air temperature of a location. This will help you to solve the mystery of the changes in Christchurch’s air temperature during El Niño years.

Vocabulary Review from Previous Lessons:

CLIMATE: General weather patterns over a long period of time

ENERGY: the ability to make things move or change

TEMPERATURE: a measure of how hot or cold something is; a measure of the average kinetic energy of the molecules of a thing

TRANSFER: to move from one object to another or one place to another

LATITUDE: the distance of a place north or south of Earth's equator

EQUATOR: the imaginary line that divides Earth into northern and southern hemispheres

OCEAN CURRENT: ocean water flowing in a continuous path

GYRE: a giant pattern of moving water that spans whole oceans and moves water from place to place in a circle

PREVAILING WINDS: winds that move in one direction and are strong enough to push ocean currents

CONTINENTS: any of Earth’s main continuous areas of land, such as Africa, Asia, and North America

Unit Question: During El Nino years, why is Christchurch, New Zealand’s temperature cooler than usual?

Location of Christchurch, New Zealand in the southern Pacific Ocean
Lesson 7 – Part 1: Investigating the Effect of Changing Winds

What affects ocean currents? You may select more than one answer. ☑

- ☐ prevailing winds
- ☐ rivers
- ☑ the Moon
- ☐ continents

Explain your choice.
What Happens When Prevailing Winds Change?

Now that we have explained the air temperature of Christchurch during a normal year, we will consider what can make the air temperature change during an El Niño year. We know that the direction of currents is determined by prevailing winds and that the current near Christchurch changes during El Niño years. Let’s see if a change in the prevailing winds could have caused this change.

Use the Sim to learn more about how changes to the prevailing winds can affect the amount of energy in the air.

Launch the Ocean, Atmosphere, and Climate Sim, go to Wind Map mode, and select SURFACE for Temperature View. Press PLAY to observe the currents, and then read about the two missions:

**Mission 1**: Find a location that has a **warm ocean current** passing by. Make a change to the wind so the air temperature of the location becomes **cooler**.

**Mission 2**: Find a location that has a **cold ocean current** passing by. Make a change to the wind so the air temperature of the location becomes **warmer**.
Mission Planning: Make a plan to complete the missions.

- Where will you place your sensor?
- What changes will you make to the wind?

Once you have a plan, complete the mission you agreed on. Follow these steps, record your data, and finally, answer the questions about your results.

1. Place your sensor on the location you selected. Press PLAY if you paused the Sim.
2. Wait for the air temperature to stabilize.
3. Record the Initial Air Temperature.
4. Make a change to the wind.
5. Wait for the air temperature to stabilize again.
6. Record the Changed Air Temperature.
7. Share your results with your partner.
8. If your mission was not successful, make a new plan and try again.
9. Answer the questions on the next page.

<table>
<thead>
<tr>
<th>Location (latitude/longitude)</th>
<th>Initial Air Temperature (°C) (after it’s stable)</th>
<th>What changes you made</th>
<th>Changed Air Temperature (°C) (after it’s stable)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Increased Wind Strength</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decreased Wind Strength</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turned off Wind</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reversed Wind</td>
<td></td>
</tr>
</tbody>
</table>
Before the change to wind:
### Increased Wind Strength:

<table>
<thead>
<tr>
<th>Location Sensors</th>
<th>Wind Strength</th>
<th>Current Speed</th>
<th>Wind Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIGH</td>
<td></td>
<td>NORMAL</td>
</tr>
</tbody>
</table>

### Decreased Wind Strength:

<table>
<thead>
<tr>
<th>Location Sensors</th>
<th>Wind Strength</th>
<th>Current Speed</th>
<th>Wind Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOW</td>
<td></td>
<td>NORMAL</td>
</tr>
</tbody>
</table>
Turned off Wind:

Reversed Wind:
What change did you finally make that changed the air temperature of your location?


State which mission you completed, and then answer this question: Why did changing the wind affect the air temperature?


The map shows the movement pattern for major ocean currents. What ideas do you have about what might make ocean currents move?
Lesson 7 – Part 1 Continued: Investigating the Effect of Changing Winds

From our Sim missions, we learned that the air temperature of a location can change when the prevailing winds change because a change to the prevailing winds causes a change to ocean currents. Ocean currents affect how much energy is transferred to or away from the air at a location. If the ocean currents change, that means the amount of energy transferred to or away from a location will be affected.

**KEY CONCEPT:** Changes to prevailing winds affect ocean currents. Changes to ocean currents affect how much energy is brought to (or taken away from) a location.

If Christchurch’s air temperature was cooler than usual, what changes would have caused this? You will get a chance to explain in the next part of Lesson 7.
Lesson 7 – Part: Analyzing Evidence

Reasoning about Air Temperature in Christchurch, New Zealand during El Niño

Question: During El Niño years, why is Christchurch, New Zealand’s air temperature cooler than usual?

Claim: The air temperature is cooler during El Niño years because ocean currents and prevailing winds change.

Reasoning: With your partner, carefully read, annotate, and discuss the following evidence. Then, explain why each piece of evidence matters in supporting the claim.

Evidence Card A: Ocean Surface Temperature

<table>
<thead>
<tr>
<th>Average Ocean Surface Temperature Near Christchurch, New Zealand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degrees Celsius</td>
</tr>
<tr>
<td>Normal Year</td>
</tr>
<tr>
<td>El Niño Year</td>
</tr>
</tbody>
</table>

Example of what you and your partner could discuss for this first piece of evidence:

This evidence supports the claim because it shows that... during normal years warm currents usually flow near Christchurch. During normal years energy transfers from the ocean to the air. However, during El Nino years, the current is not as warm, so less energy will transfer from the current to the air, making Christchurch cooler than usual.
**Evidence Card B: Prevailing Winds and Ocean Currents During Normal Years**

A warm current moving north from the equator keeps Japan warmer than other places at the same latitude. A cold current traveling north from Antarctica keeps the western coast of Australia cooler than other locations at the same latitude.

<table>
<thead>
<tr>
<th>This evidence supports the claim because it shows that...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>During normal years the ocean current that goes by Christchurch comes from:</strong> (Circle one)</td>
</tr>
<tr>
<td>The Equator</td>
</tr>
<tr>
<td><strong>This current carries (circle one)</strong></td>
</tr>
<tr>
<td>Cold Water</td>
</tr>
<tr>
<td><strong>Energy would transfer from (circle one)</strong></td>
</tr>
<tr>
<td>Air to Water</td>
</tr>
</tbody>
</table>
Evidence Card C: Wind Changes During El Niño Years
During El Niño years, the normal prevailing winds are disrupted. It is possible for them to slow down or reverse.

This evidence supports the claim because it shows that...

<table>
<thead>
<tr>
<th>During El Niño years, prevailing winds slow down or _________________________________.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevailing Winds are one thing that determine the direction of (circle one)</td>
</tr>
<tr>
<td>Continents</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>If the prevailing winds change direction, (circle one)___________________________ change direction too.</td>
</tr>
<tr>
<td>Continents</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>This means that instead of energy transferring from water to air in Christchurch, energy would transfer from</td>
</tr>
<tr>
<td>Water to air</td>
</tr>
<tr>
<td>This would cause the air temperature at Christchurch to (circle one)</td>
</tr>
<tr>
<td>Increase</td>
</tr>
</tbody>
</table>

16
Evidence Card D: Evidence from the Sim
When prevailing winds change speed or direction, ocean currents also change.

This evidence supports the claim because it shows that...

<table>
<thead>
<tr>
<th>When prevailing winds change direction, the __________________________ of ocean currents also changes.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>If a current going by a location used to bring warm water, it now brings __________________________ temperature water by that location.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Instead of energy transferring from water to air, energy would not transfer from______________(circle one)</th>
</tr>
</thead>
</table>

| Water to air | Air to water |
Lesson 7 – Part 3: Explaining the Change in Air Temperature in Christchurch

Congratulations, student climate scientists! You figured out what determines Christchurch’s air temperature during a normal year. Now you are ready to help the New Zealand Farm Council understand why Christchurch’s air temperature is cooler than normal during El Niño years.

Use evidence from Card A, Card B, Card C, and Card D to help you write a message to the New Zealand Farm Council. Be sure to explain the evidence and why it matters. You may wish to use some of the vocabulary words listed in the Word Bank and the Scientific Argument Sentence Starters below to help you write.

**Word Bank:**

<table>
<thead>
<tr>
<th>Ocean Current</th>
<th>Air Temperature</th>
<th>Prevailing Winds</th>
<th>Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td>Effect</td>
<td>Equator</td>
<td>Poles</td>
</tr>
<tr>
<td>Energy</td>
<td>Latitude</td>
<td>El Niño</td>
<td></td>
</tr>
</tbody>
</table>

**Scientific Argument Sentence Starters**

| Describing how the evidence supports the claim: |
| If ____________, then . . . | This is important because . . . |
| Since ____________, . . . | Based on the evidence, I conclude that . . . |
| This claim is stronger because . . . |

**Question:** During El Niño years, why is Christchurch, New Zealand’s air temperature cooler than usual?

**Claim:** The air temperature is cooler during El Niño years because ocean currents and prevailing winds change.

To New Zealand Farm Council:

The air temperature is cooler during El Niño years because ocean currents and prevailing winds change.

My first piece of evidence to explain **why the air temperature is cooler during El Niño years** is comes from

*Evidence Card A: Graphs of Air Temperature and Ocean Surface Temperature during normal and El Niño Years.*

In this evidence you can see that in a **normal year** the **air temperature** is (circle one)

<table>
<thead>
<tr>
<th>Higher than</th>
<th>Lower than</th>
<th>Equal to</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is during an El Niño year.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We can also see that in **normal years** the **ocean surface temperature** is (circle one)

<table>
<thead>
<tr>
<th>Higher than</th>
<th>Lower than</th>
<th>Equal to</th>
</tr>
</thead>
</table>

than it is during an El Niño year.

This evidence supports the claim because it shows that during normal years energy transfers (circle one):

<table>
<thead>
<tr>
<th>From the ocean to the air</th>
<th>From air to ocean</th>
<th>Neither</th>
</tr>
</thead>
</table>

This evidence supports the claim because it shows that during El Niño years energy transfers (circle one):

<table>
<thead>
<tr>
<th>From the ocean to the air</th>
<th>From air to ocean</th>
<th>Neither</th>
</tr>
</thead>
</table>

My second piece of evidence to explain why the air temperature is cooler during El Nino years is comes from Evidence Card B: Prevailing Winds and Ocean Currents During Normal Years.

In this evidence you can see that oceans currents that come from the (circle one) north west equator poles bring ____________ temperature water to places they pass and ocean currents that come from (warm / cool) (circle one) north west equator poles bring ____________ temperature water to places they pass. This evidence also shows the direction (warm / cool) of prevailing winds and ocean currents. Prevailing winds causes ocean current to move in (circle one) the same a different direction as the wind. This evidence supports the claim because it shows that (circle one) gravity from the moon prevailing winds temperature differences cause Ocean Currents to move. It also shows that the water that passes by Christchurch has ____________ (warmer / cooler) temperature because the current begins near the (circle one) equator pole

This means that energy will transfer from the (circle one) Air to Ocean Ocean to Air
My last piece of evidence to explain why the air temperature is cooler during El Nino years is comes from Evidence Card D: Evidence from the Sim.

In the Sim changing wind speed or wind direction affects what happens to the ocean currents.

In this evidence you can see that when the prevailing winds change direction, the direction of ocean currents ___________________________.

(slow down / speeds up / changes direction / can do any of these changes)

This evidence supports the claim because an ocean current that once began at the equator and brought ______________ temperature water would now start at the ___________________ and bring ______________ temperature water.

(warmer / cooler)

Before the wind direction changed, energy transferred from the ocean to air. If the wind direction changes,

energy will now transfer from the _______________ to ________________ .

(ocean / air) (ocean / air)

Therefore, my evidence and explanations clearly show that the air temperature is cooler during El Nino years because ocean currents and prevailing winds change.

Sincerely, Your name: ___________________________