Main Idea

What is climate?
I found this on page _______

What affects climate?
I found this on page _______

Details

Define climate.
Climate: ______________________________________________________________________

Identify 4 factors that determine a region’s climate.
1. ______________________________________________________________________
2. ______________________________________________________________________
3. ______________________________________________________________________
4. ______________________________________________________________________

Describe how latitude affects climate in different regions on Earth.
Polar regions: ______________________________________________________________________
Locations near the equator: ______________________________________________________________________
Middle latitudes: ______________________________________________________________________

Compare how altitude and latitude influence temperature.

<table>
<thead>
<tr>
<th>Altitude</th>
<th>Latitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>As altitude increases, temperature</td>
<td>As latitude increases, temperature</td>
</tr>
</tbody>
</table>
Lesson 1 | Climates of Earth (continued)

Main Idea

I found this on page ________.

Details

Sequence the events that result in a rain shadow.

1. Prevailing winds carry ____________, ____________ air over Earth's surface.

2. As air approaches a mountain, it ________ and ________. Water vapor in the air ______________ falls.

3. The air is now ____________. It passes over the mountain, sinks, and ____________

4. Dry, hot air causes a ______________ to form on the ______________ slope of the mountain.

Large Bodies of Water

I found this on page ________.

Define specific heat, and then explain how the specific heat of water can influence the climate of an area.

Specific heat: __________________________

Explanation: __________________________

Classifying Climates

I found this on page ________.

Define microclimate, and identify three microclimates.

Microclimate: __________________________

1. __________________________
2. __________________________
3. __________________________
Details

Identify and describe Koppen's 5 climate types.

Climate Types

I found this on page ____________.

Explain two ways that climate can affect people.

Agriculture: ____________________________________________________________

Architecture: __________________________________________________________

I found this on page ____________.

Analyze how climate affects each of the following organisms.

Polar bears: ____________________________________________________________

Desert plants and animals: ____________________________________________

Deciduous trees: ______________________________________________________

Connect It: Classify the climate in your area, and give reasons for your classification.
Lesson 2  Climate Cycles

Predict three facts that will be discussed in Lesson 2 after reading the headings. Record your facts in your Science Journal.

Main Idea

Long-Term Cycles
I found this on page __________.

Details

Distinguish four ways scientists learn about past climates.
1. ___________________________________________________________________
2. ___________________________________________________________________
3. ___________________________________________________________________
4. ___________________________________________________________________

Compare an ice age with an interglacial.
Ice age: __________________________________________________________________
Interglacial: __________________________________________________________________

Model the time spanned by Earth's most recent ice age and interglacial on the time line. Use these labels:
- Ice age begins
- Maximum ice coverage
- Holocene interglacial begins

Identify four causes of Earth's long-term climate cycles.
1. ___________________________________________________________________
2. ___________________________________________________________________
3. ___________________________________________________________________
4. ___________________________________________________________________

Climate  147
Main Idea

Short-Term Cycles
I found this on page ______.

Details

Summarize two causes of short-term climate cycles.

- Causes of short-term climate cycles
  - Interaction between

Diagram the position of Earth and its axis in relation to the Sun during summer and winter in the northern hemisphere.

- Summer in the Northern Hemisphere
- Winter in the Northern Hemisphere

Explain, in your own words, how the tilt of Earth's axis causes seasons.
Main Idea

I found this on page ___________.

Details

Review how Earth's equinoxes and solstices mark the beginning of each of the 4 seasons in this organizer.

The Beginnings of Seasons

Solstices
- Summer: axis ___________ to the Sun
- Winter: axis ___________ from the Sun

Equinoxes
- axis tilted so that both northern and southern hemispheres receive ___________ amounts of sunlight.
- beginning of ___________ and ___________

Sequence the statements to describe the phenomenon of El Niño/Southern Oscillation.

_____ Warm water surges back to South America, preventing cold water from upwelling.

_____ Trade winds that blow from east to west weaken.

_____ The normal pattern of high and low pressure across the Pacific is reversed.

Compare ENSO and NAO weather patterns.

<table>
<thead>
<tr>
<th>ENSO: El Niño/Southern Oscillation</th>
<th>NAO: North Atlantic Oscillation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Description:</td>
</tr>
<tr>
<td>Weather Pattern:</td>
<td>Weather Pattern:</td>
</tr>
</tbody>
</table>
Main Idea

I found this on page ________.

Details

Explain how monsoons change with the seasons.

Summer: ____________________________

_________________________________

_________________________________

Winter: ____________________________

_________________________________

Define drought.

Drought: ____________________________

Model the results of a drought and a heat wave occurring at the same time.

Drought

Heat Wave

a. __________ damage

b. __________ shortages

c. loss of __________

Describe the cause of cold waves.

_________________________________

_________________________________

Analyze It

Review what can happen during a drought and heat wave. What might be the effect of a cold wave?

_________________________________

_________________________________
**Main Idea**

**Regional and Global Climate Change**
*I found this on page ___._

**Human Impact on Climate Change**
*I found this on page ___._

---

**Details**

**Summarize** Earth’s air temperature over the past 100 years.

<table>
<thead>
<tr>
<th>Period</th>
<th>Temperatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880–1900</td>
<td></td>
</tr>
<tr>
<td>1900–1945</td>
<td></td>
</tr>
<tr>
<td>1945–1975</td>
<td></td>
</tr>
<tr>
<td>1975–2000+</td>
<td></td>
</tr>
</tbody>
</table>

**Define** global warming, and explain the conclusion of the Intergovernmental Panel on Climate Change (IPCC).

Global warming: ___________________________

The IPCC concluded that most of the temperature increase is due to ______________________, such as burning _______ and ____________.

**Explain** how greenhouse gases affect Earth’s temperatures.

<table>
<thead>
<tr>
<th>Natural Greenhouse Effect</th>
<th>Temperatures suitable for life are</th>
</tr>
</thead>
<tbody>
<tr>
<td>(CO₂), ___________________</td>
<td>___________________________</td>
</tr>
<tr>
<td>and water vapor</td>
<td></td>
</tr>
<tr>
<td>Earth’s outgoing infrared</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Over the Last 120 Years</th>
<th>Average surface temperatures have been</th>
</tr>
</thead>
<tbody>
<tr>
<td>An increase in CO₂ levels causes ______________________</td>
<td>___________________________</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Main Idea**

I found this on page ________.

**Details**

**Identify** three natural sources of carbon dioxide (CO₂).

1. ____________________________________________

2. ____________________________________________

3. ____________________________________________

**Recall** two human-caused sources of carbon dioxide (CO₂).

Human sources

**Explain** how aerosols are released into the atmosphere.

Aerosols ____________ sunlight back into space, which results in ________ temperatures.

Clouds with ____________ amounts of aerosols have ____________ cloud droplets that ____________ more sunlight, which ____________ climate.

**Climate and Society**

I found this on page ________.

**Identify** the problems climate change poses for society.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>____________ and ___________________________</td>
<td>food and water shortages</td>
</tr>
<tr>
<td>____________</td>
<td></td>
</tr>
<tr>
<td>excessive rainfall</td>
<td></td>
</tr>
</tbody>
</table>

152 Climate
Main Idea

I found this on page ________.

Details

Explain the environmental impacts of climate change.

<table>
<thead>
<tr>
<th>Warmer Temperatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. cause more water to ______________, producing __________________ and __________________ storms.</td>
</tr>
<tr>
<td>b. __________ glaciers and polar ice sheets and cause ______________ to rise.</td>
</tr>
<tr>
<td>c. melt the frozen __________ in the Arctic, changing ______________ patterns.</td>
</tr>
<tr>
<td>d. cause ______________ weather events to become more common.</td>
</tr>
</tbody>
</table>

Define the global climate model (GCM), and explain the limitations of the model’s predictions.

GCM: ________________________________________________________________

Describe two activities of increasing human populations that might affect climate.

1. ________________________________________________________________
2. ________________________________________________________________

Identify two ways people can reduce greenhouse gases.

1. ________________________________________________________________
2. ________________________________________________________________

Synthesize It

Identify ways that people in your community could help to reduce greenhouses gases.