

THE MONSOONS

Credit: https://media.nationalgeographic.org/assets/file/TWS_The_Monsoons.pdf

GUIDING QUESTION

How does the South Asian monsoon affect climbers on Mount Everest?

Students analyze a climograph and maps of monsoon seasons to understand precipitation patterns, then predict the effect of climate on Everest climbers.



Handouts

- South Asia's Monsoons: Winter and Summer
- Analyzing Himalayan Climate

Film Clip

- "Monsoon Sets In"

VOCABULARY

- climate
- climograph
- monsoon
- precipitation
- weather

DIRECTIONS

1. Help students imagine the climate on Mount Everest.

On their KWL chart from Activity 1: Name that Destination, give students a few minutes to add information to the L (What I've Learned) column from any previous activities. Ask: *What are some unique things we know about the conditions at the summit of Mount Everest?* (It's very steep and icy; 29,035 feet in elevation; the air is less dense and there's less oxygen than at lower elevations; it's extremely cold and windy.) Explain that students are going to look at the climate of South Asia to determine the best time to climb Mount Everest. The climate near the summit of Mount Everest is frigid year-round. With the extreme altitude, there are no living things near the summit. The only living things to venture that high are humans! Air moving each year from the north and the south has an impact on Everest and the countries surrounding it. Ask: *Have you heard of the term monsoon?* Students may recognize the term as meaning "rainy season." Explain to students that the term *monsoon* actually refers to the winds, which blow in particular directions at different times of the year.

2. Display the monsoon maps.

Display the winter and summer monsoon maps on **Handout 1: South Asia's Monsoons: Winter and Summer**, on an overhead or projection system. Have students focus on the directions of the arrows on each map, and have them describe the differences in the winter and summer maps. Ask:

- *In winter, where do winds originate? (over land)*
- *In summer, where do the winds originate? (over water)*
- *Which winds do you think would bring rains, and which would bring dry air? (In South Asia, winter winds over land bring dry weather, and summer winds moving over the ocean bring precipitation.)*
- *What do you think happens to that precipitation at high altitudes on Mount Everest? (precipitation is snow)*
- *How do you think the monsoon affects the Sherpa and other communities who live near Mount Everest?*

3. Have students look at the timing for movement of the summer monsoon.

Have students find Mount Everest on the summer monsoon map. Then focus on the lines with dates showing the normal advance of the monsoon. Ask: *When do you think the monsoon is likely to reach Mount Everest?* Show the film clip, "Monsoon Sets In." Discuss whether the timing looks good for Conrad Anker to make the push for the summit. The map of



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“The monsoon arrives early June every year. It releases a tremendous amount of snow. Climbing is impossible.”

– Conrad Anker

monsoon onset dates is very similar to the one Jennifer Lowe-Anker, Conrad's wife, viewed in the clip. Discuss the difference technology has made in both communications and weather prediction since Mallory's climb.

4. Use the climate graph and average temperatures to help predict when to climb.

Give students copies of **Handout 2: Analyzing Himalayan Climate**, also projecting the climograph if possible. Explain that a climograph shows patterns of average temperature and precipitation throughout the year. Have students analyze the graph and answer the questions, then use the information from this chart and the maps to decide the best time to try to climb Everest.

EXTENDING THE ACTIVITY

Have students research wind speeds on Mount Everest, which create a “wind-chill” effect on temperature that makes the air feel even more frigid. Discuss how wind speed also impacts the timing for climbing.

This link provides useful data:

<http://www.explorersweb.com/adventureweather/charts/>

Have students imagine setting off from camp for the summit push. Before leaving, they write a letter to a parent or friend explaining the conditions and their plans. Include details and descriptive language about timing, oxygen use, weather, elevation, and other factors. For example:

Dear Mom,

It's May 19 and we're at 21,000 feet. I'm pretty well acclimated to this elevation, but I feel exhausted. The wind is really horrible. We measured wind speeds of 50 miles per hour, so we can't even get out of the tent! We're saving our oxygen for the summit push. If the wind dies down tomorrow, we will climb to 25,000 feet, rest in the tent and then get up late at night to head for the summit. If not, we will rest here at 21,000 feet for another day. I am worried about waiting too much longer, because the monsoons will come and dump snow on us. Then... I'm outta here!

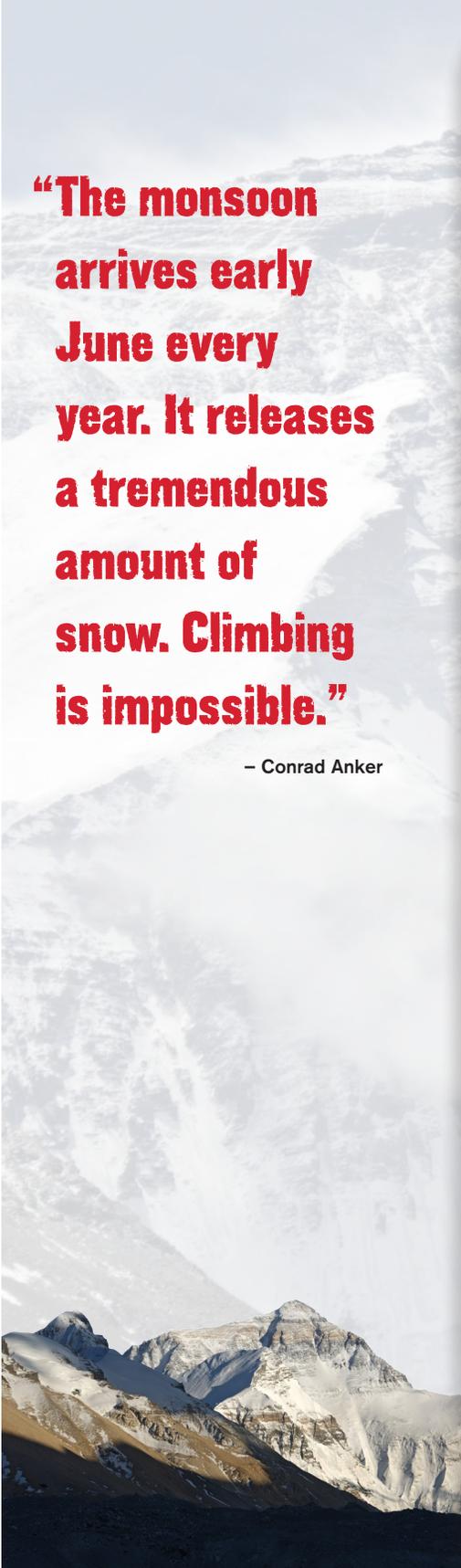
Love,

Your Everest Climbing Daughter/Son

SUGGESTED RESOURCES

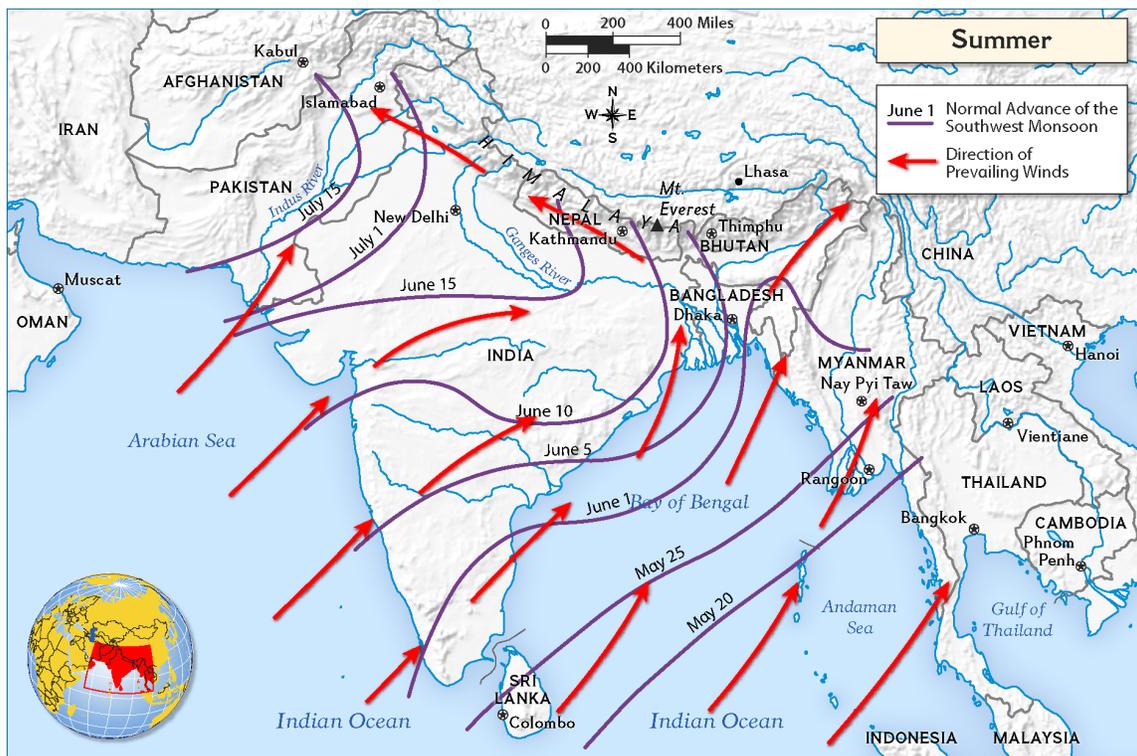
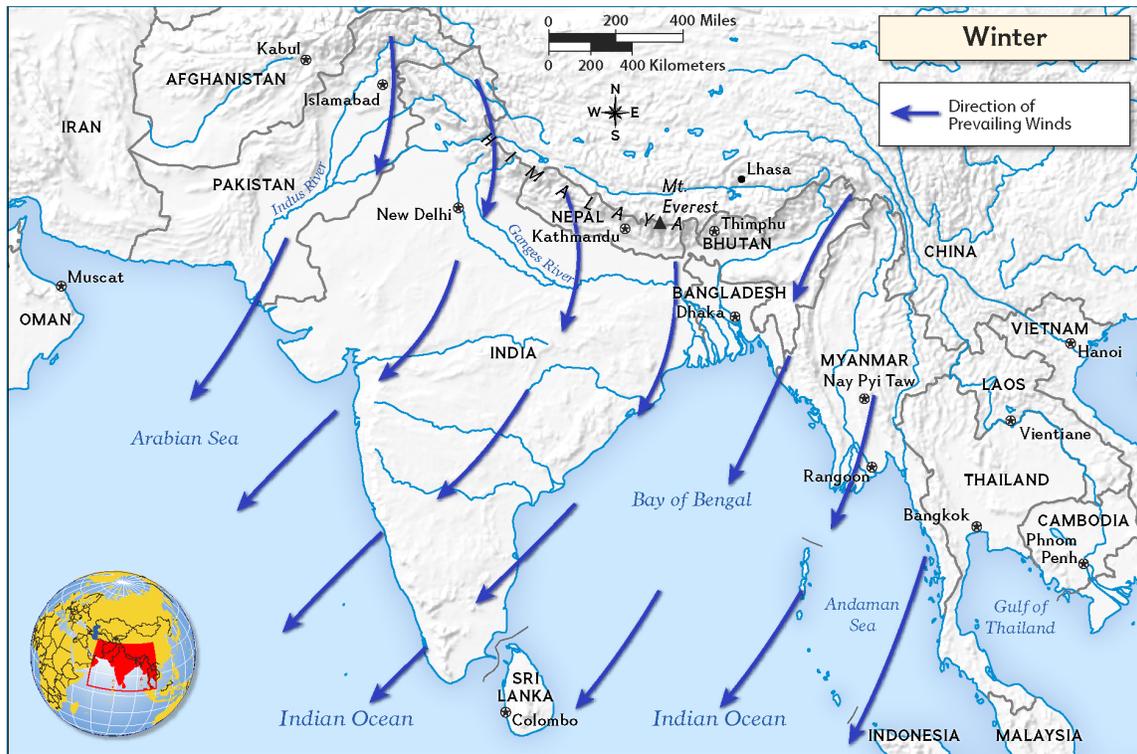
National Geographic News on Everest Winds: http://news.nationalgeographic.com/news/2002/04/0426_040226_everestwinds.html

Find data to create climographs: <http://www.worldclimate.com/>



SOUTH ASIA'S MONSOONS: WINTER AND SUMMER

HANDOUT 1

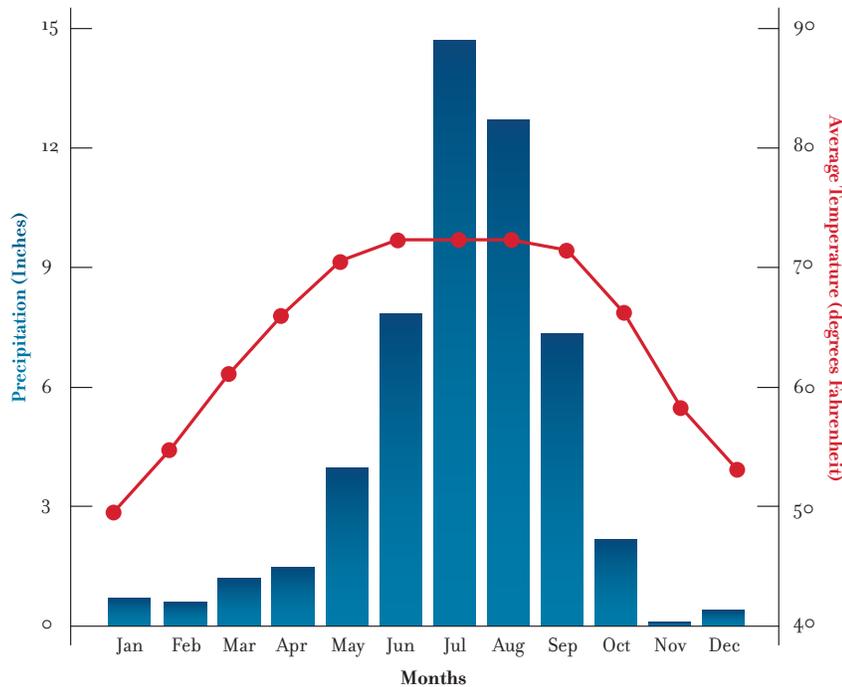


ANALYZING HIMALAYAN CLIMATE

Analyze the information in the climograph below and the Everest temperature chart. Then answer the questions below.

A CLIMOGRAPH OF KATHMANDU, NEPAL

Elevation: 1,400 m Absolute Location: 27.70°N 85.30°E



Source: www.WorldClimate.com

EVEREST AVERAGE TEMPERATURES

Base Camp: 6,100 m

Month	°C	°F
January	-16°	3°
February	-16°	3°
March	-13°	9°
April	-10°	14°
May	-7°	19°
June	-5°	24°
July	-3°	27°
August	-4°	26°
September	-6°	22°
October	-10°	15°
November	-11°	12°
December	-15°	5°

Source: MountEverest.net
<http://www.mounteverest.net/story/ExWebseries-WinterclimbingTheBADchart,part2Dec172004.shtml>

- Which four months have the most precipitation in Kathmandu?

- When are the warmest temperatures on Mount Everest?

- When do you think is the best time to climb Mount Everest? Explain. Use what you've learned about the monsoon, precipitation, and temperature.

