# Science on the Web

Activity 4
Weather and Climate

*F*riday! Tomorrow, Jane and some friends are going to the beach or to the desert. So far, they can't decide where they will go. Jane offered to check out the weather because they don't want to go swimming if it is too cold, or to the desert if it is too hot. If it is cold on the beach and hot in the desert, they would just hang out at the mall. Living in the hills as she did, Jane was often surprised to see that the weather just a few miles away could be so different from that at home.

The radio weather man had said tomorrow's weather would be "more of the same." She decided to try to find out the temperature today in San Diego and in Palm Springs.
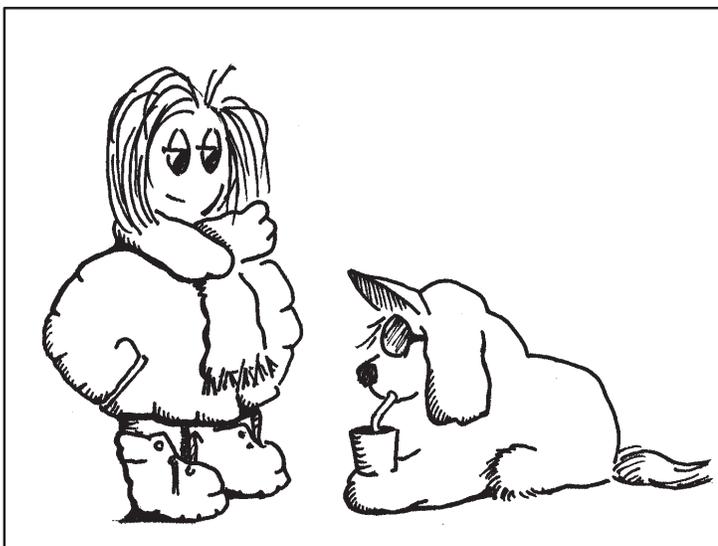
Jane tried to get Mrs. Fine to help her, but she was out of the building that day. It wasn't until the end of the day that Jane ran into Mr. Goodman. He was a parent who volunteered in the computer lab, and he knew a lot about the Web. After school, Jane sat down with Mr. Goodman and learned how she could find the answers to her questions.

The Web is loaded with weather data, but finding it in a form that is usable is laborious. Mr. Goodman seemed to be enjoying the many weather pages, and pretty soon Jane thought this might turn into a week-long project instead of a 5-minute query. But she saw that if she focused on one set of pages, she could settle the weather question that would decide where they would go tomorrow. Still, it was Friday afternoon and Jane wanted to be done with "school" for the week. She thanked Mr. Goodman, and went to an open computer.
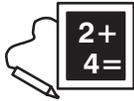
Finding Local Weather Conditions

There are lots of places on the Web with weather data, and you might find one that you like particularly. If so, bookmark it. But to get you started, go to the National Weather Service home page.

http://www.nws.noaa.gov

There are lots of interesting pages here to explore.

To get to the temperatures, jump to the regional NWS office information. You need to move to a different NWS site.

http://iwin.nws.noaa.gov

Graphics version
Local Weather

Point to the map and click on **California**
Point to the map and click on **San Diego** and read the temperature, wind, and sky conditions.
Go back and click on **Palm Springs**; read the temperature, wind, and sky conditions.

? Questions

4–1. What is the weather like in San Francisco today?

4–2. Jane had to call her friends that night to tell them what the weather was going to be and where they were going tomorrow. Her choices could be diagrammed as shown.
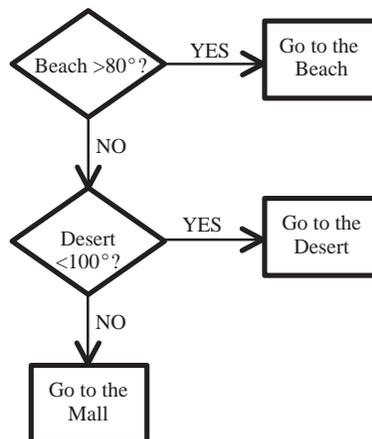
What did they decide to do based on today's weather in San Diego and in Palm Springs?

For a commercial site that gives weather, try **http://www.intellicast.com**.

*J*ane was satisfied with her weather search, but you can hardly hear about the weather these days without hearing about El Niño. She decided to spend a few minutes reading about the "El Niño Southern Oscillation." And while she was at it, she thought she'd look at what, besides a lot of rain, might happen with a climate change.

Researching El Niño

El Niño is a large-scale effect that lasts for months, if not years. Weather reflects the impact of climate. So let's go to the Climate and Diagnostics Center of NOAA.

http://www.cdc.noaa.gov

> General ENSO Information
> What Happens during an El Niño?
> Check out the 3-D animation and read the description about El Niño.

Look at some weather maps

While you're at CDC, take a look at some actual weather data. You can begin to see the complexity of what is behind a simple weather forecast of "sunny and mild."

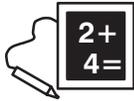> From the CDC home page, look at the Map Room

> Weather Products
> Current Weather Plots

Questions

4–3. What is the difference between weather and climate? (Look at Background at the CDC site.)

4–4. What causes El Niño? Is the condition good or bad?

2+ 4= Locating Icebergs

One phenomenon that, like weather, changes daily, but also, like climate, has a long-term pattern of change is the creation and location of icebergs. The Titanic showed us why it is important to know where icebergs are located.

Since 1900, The U.S. Coast Guard has conducted a count of icebergs month by month. Look at their Internal Ice Patrol home page.

http://www.rdc.uscg.mil/iippages

> Data
> International Ice Patrol Iceberg Count Data

Look at the data listing for the various months and years.

? Questions

> 4–5. Compute some 5-year averages of total number, starting with 1997 and going back. Which 5 years have the highest number or icebergs?
>
> 4–6. In general which months have the highest numbers of icebergs? Why?
>
> 4–7. What long-term effects might we expect on icebergs if our climate changes?

Tracking an iceberg

In 1983, the U.S. Coast Guard placed radio beacons on several icebergs to track their movement in the ocean. The beacons were monitored by satellites overhead. One of the icebergs was called "02625.ndc," after the radio beacon that was used. You can track this buoy by visiting the **ftp** site with your browser.

Go **Back** to the IIP home page (**http://www.rdc.uscg.mil/iippages**)

> Data
> International Ice Patrol Iceberg Data Buoys
> ftp site
> 02625.ndc

This is a sample of the data. You can find an explanation of the fields at the **ftp** site, but we have delineated it for you below.

Space
Environment
Center

156	C02625533336N0544424W8303242255000	0001
156	C02625532512N0545135W8303260715000	0002
156	C02625532100N0545100W8303261222000	0003
156	C02625530112N0545024W8303270701000	0004
156	C02625524836N0544424W8303271515000	0005
156	C02625524836N0544424W8303271832000	0006
156	C02625524424N0544123W8303280834000	0007
156	C02625524424N0544123W8303281133000	0008
156	C02625525547N0542547W8304011141000	0009

156 C02625525547N0542547W8304011141000 0009

Buoy no. | Latitude DD | MM | SS | North | Longitude DDD | MM | SS | West | Date YY | MM | DD | Time HH | MM | Observation No.

? Questions

4–8. Where in the world was the "02625" iceberg? Plot its initial location on a graph.

4–9. On the graph, plot the path of the berg while it was under observation.

4–10. Determine the approximate fastest speed of the berg in knots.