Activity #2 - Major Ocean Surface Currents

Concepts # 3 & 6

 # 3 Atmospheric cells and ocean gyres redistribute heat from low to high latitudes, which influences climate, weather, and ocean temperature.

#6 Surface currents are created by the prevailing wind system.

Objective:

Students investigate wind driven surface currents and prevailing winds by playing a card game.

Materials:

- cards
- scissors
- cardstock
- glue
- basin chart
- surface current chart
- questions

Procedures: (See illustrations)

1. Students cut out set of cards and glue the backs and corresponding fronts onto cardstock.
2. After the cards are dry, sort the cards into 4 groups by north or south and Atlantic or Pacific.
3. Students choose a group of cards to begin. Pick out two of the current cards and pencil in their locations on the Global Ocean Basin Chart. Turn the cards over and examine the information. Write the temperature information next to the current on the chart.
4. Predict where the other two currents will be found and what their temperatures will be, based on what you already know about this hemisphere and ocean basin from the first two cards. Check your predictions. If not correct, determine why and draw in the currents as shown on the cards.
5. Students choose only one card from the next group. Draw the current, label the temperature and make a prediction as to where the other three currents are and their temperatures. Check your predictions and make changes on your chart as necessary.
6. Now select two currents from one of the remaining card sets. Pencil in the current and the temperatures of each. Make predictions for the remaining two currents, check your answers, and change as necessary.
7. For the last set of cards, choose only one current to record and then make predictions about the remaining 3 currents. Correct your markings on the chart as necessary.
8. Use what you have learned so far to pencil in the circulation pattern in the Indian Ocean.
9. Using the Global Ocean Surface Current Chart, check your predictions about the Indian Ocean pattern and correct as necessary.

Evaluation:

Use the information you have learned to answer the following questions:

- In which direction do the ocean currents under the Trade Winds flow?
- In which direction do ocean currents under the Prevailing Westerlies flow?
- Wind driven ocean currents are deflected by continental boundaries to form gyres. What is the one latitude where there is no continental barriers?
- At what latitude are the ocean gyres centered?
- In which direction do the gyres flow in the Northern Hemisphere? In the Southern Hemisphere?
- From which direction does the ocean gyre current flow near Perth, Australia?
- Warm water is transported toward the poles on which side of the ocean basins? Cold water transported from the poles is on which side of the ocean basin?
- What temperature is the ocean gyre current near the west coast of South America?
- In which side of the ocean basin are fast moving currents found? In which side are slow moving currents found?
- What speed is the surface current near Tokyo, Japan? Slow or fast?
- In the North Indian Ocean why is there no permanent gyre?
- Why is the West Wind Drift the largest volume current in the world?
- Explain what you have learned in this lesson about the interaction of the Sun, atmosphere, and ocean in creating surface circulation in the ocean.

Activity #2 - Wind Driven Ocean Circulation

Ocean:	Atlantic
Hemisphere:	Northern
Location:	Northern Basin
Flows:	From Canada to Europe
Temperature:	Cooling
Character:	Slow, Shallow & Wide

Ocean:	Atlantic
Hemisphere:	Northern
Location:	Eastern Basin
Flows:	From pole towards equator
Temperature:	Cold
Character:	Slow, Shallow & Wide

Ocean:	Atlantic
Hemisphere:	Northern
Location:	Western Basin
Flows:	From equator towards pole
Temperature:	Warm
Character:	Fast, Deep & Narrow

Ocean:	Atlantic
Hemisphere:	Northern
Location:	North of Equator
Flows:	From Africa to South America
Temperature:	Warming
Character:	Slow, Shallow & Wide

Activity #2 - Wind Driven Ocean Circulation

Ocean:	Pacific
Hemisphere:	Southern
Location:	Eastern Basin
Flows:	From pole towards equator
Temperature:	Cold
Character:	Slow, Shallow & Wide

Ocean:	Pacific
Hemisphere:	Southern
Location:	Western Basin
Flows:	From equator towards pole
Temperature:	Warm
Character:	Fast, Deep & Narrow

Ocean:	Pacific
Hemisphere:	Southern
Location:	Southern Basin
Flows:	West to east around Antartica
Temperature:	Cooling
Character:	Slow, Largest Volume Current

Ocean:	Pacific
Hemisphere:	Southern
Location:	South of Equator
Flows:	From South America to Australia
Temperature:	Warming
Character:	Slow, Shallow & Wide

Activity #2 - Wind Driven Ocean Circulation

Ocean:	Pacific
Hemisphere:	Northern
Location:	Western Basin
Flows:	From equator towards pole
Temperature:	Warm
Character:	Fast, Deep & Narrow

Ocean:	Pacific
Hemisphere:	Northern
Location:	Northern Basin
Flows:	From Asia to North America
Temperature:	Cooling
Character:	Slow, Shallow & Wide

Ocean:	Pacific
Hemisphere:	Northern
Location:	Eastern Basin
Flows:	From pole towards equator
Temperature:	Cold
Character:	Slow, Shallow & Wide

Ocean:	Pacific
Hemisphere:	Northern
Location:	North of Equator
Flows:	From Central America to S.E. Asia
Temperature:	Warming
Character:	Slow, Shallow & Wide

Activity #2 - Wind Driven Ocean Circulation

Ocean:	Atlantic
Hemisphere:	Southern
Location:	Eastern Basin
Flows:	From pole towards equator
Temperature:	Cold
Character:	Slow, Shallow & Wide

Ocean:	Atlantic
Hemisphere:	Southern
Location:	South of Equator
Flows:	From Africa to South America
Temperature:	Warming
Character:	Slow, Shallow & Wide

Ocean:	Atlantic
Hemisphere:	Southern
Location:	Southern Basin
Flows:	West to east around Antartica
Temperature:	Cooling
Character:	Slow, Largest Volume Current

Ocean:	Atlantic
Hemisphere:	Southern
Location:	Western Basin
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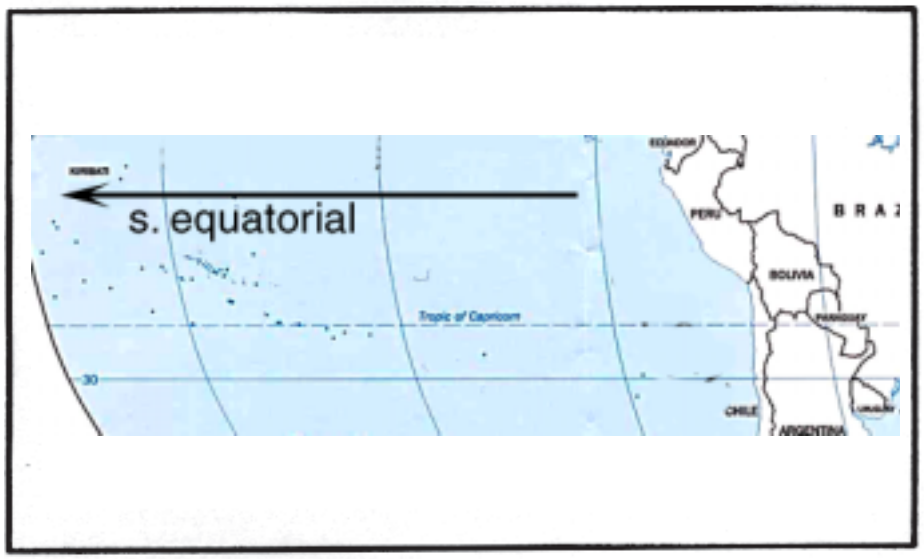

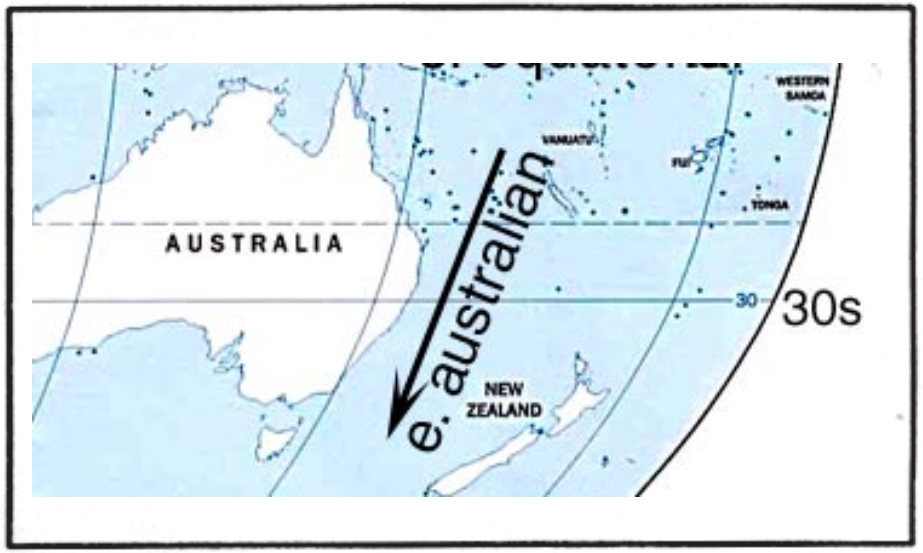

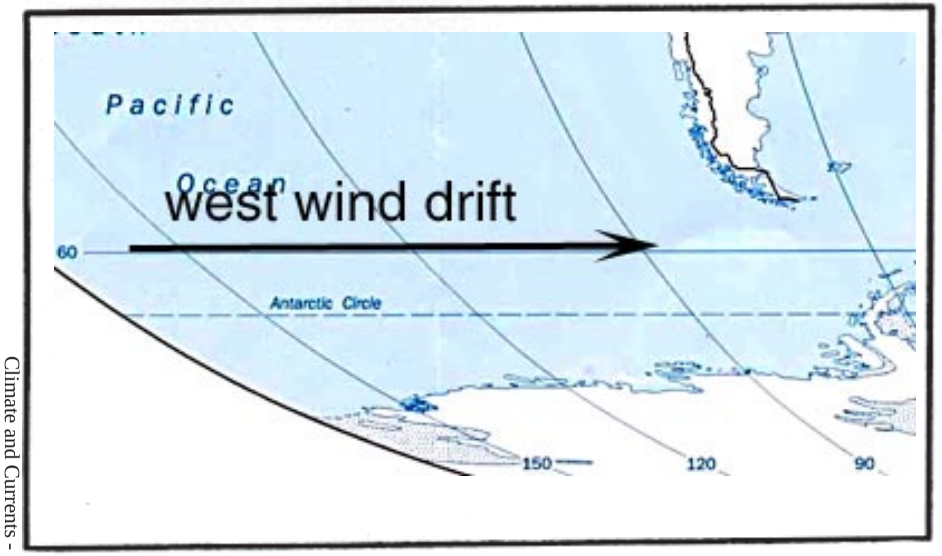

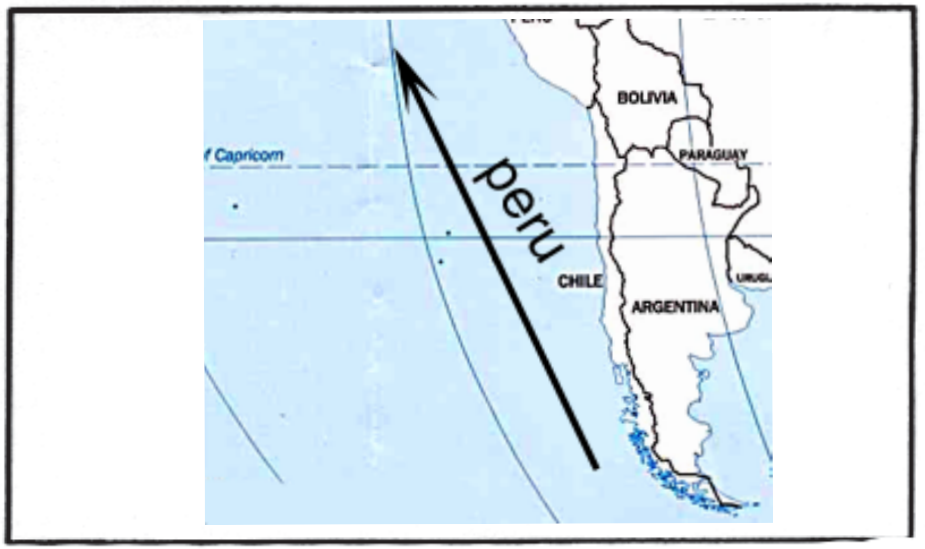

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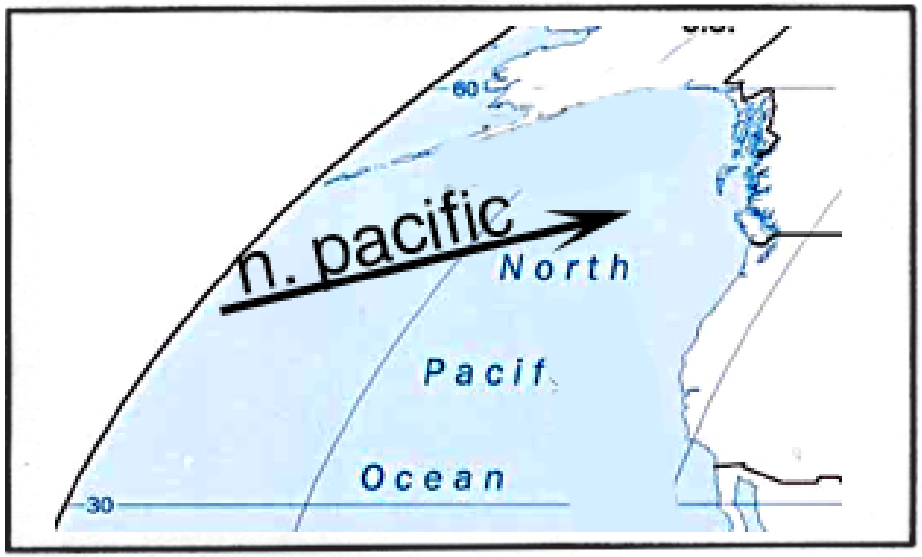

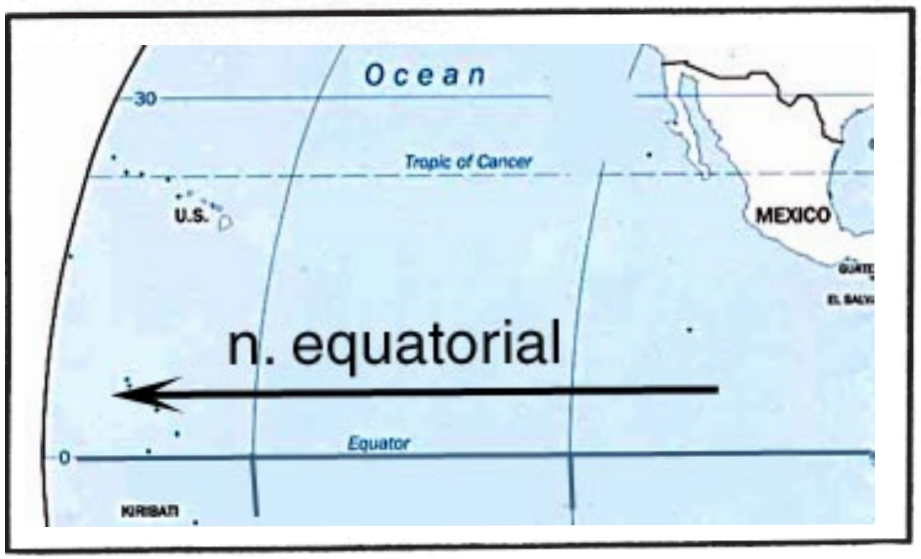

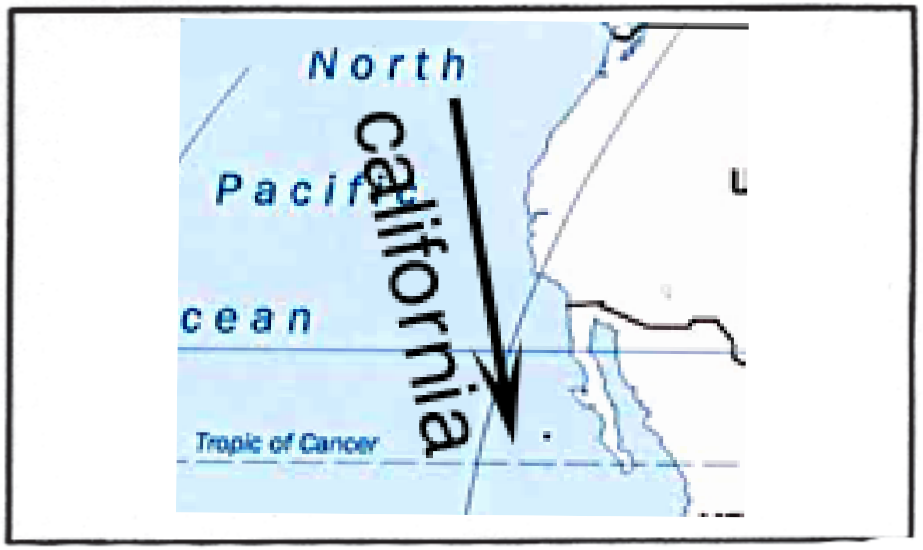

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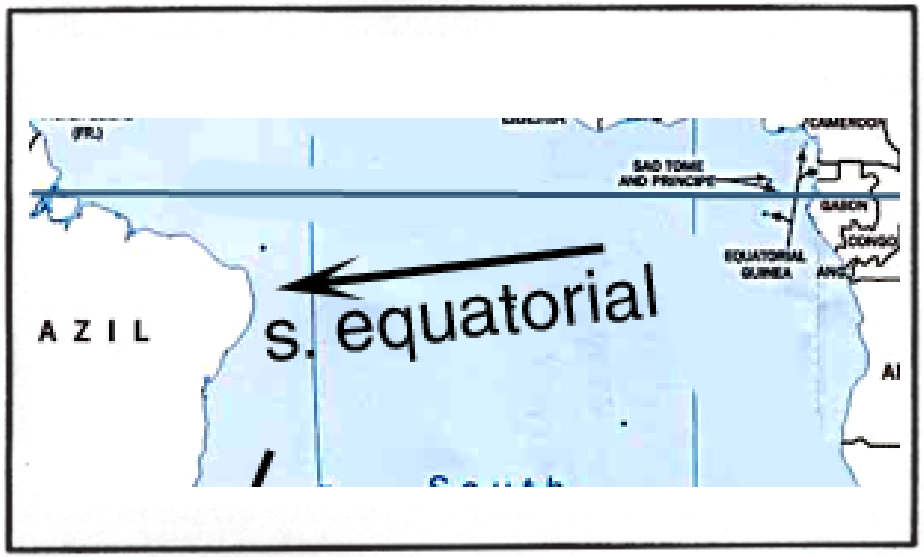

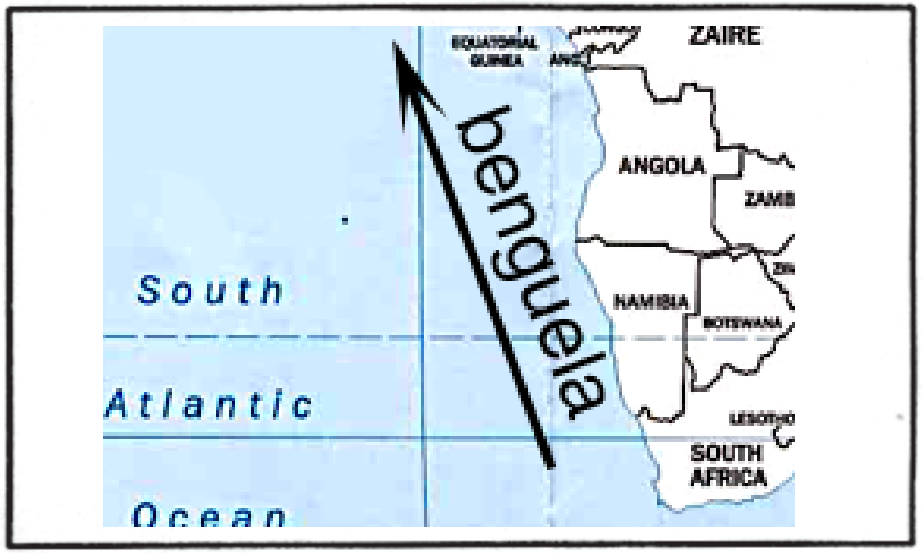

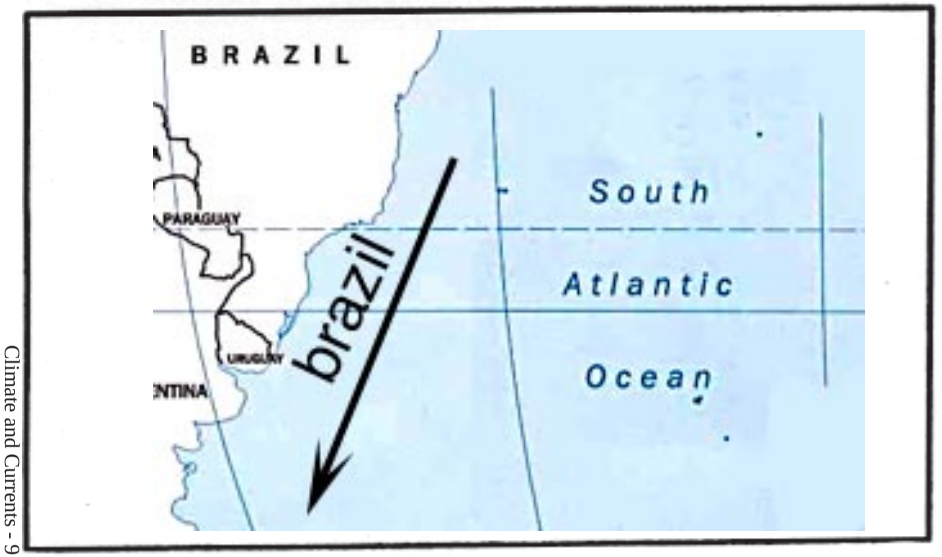

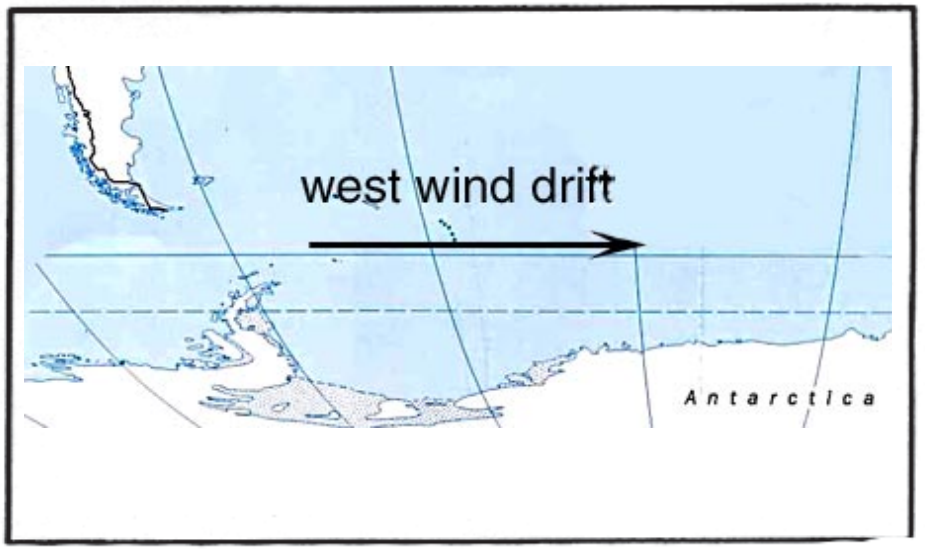

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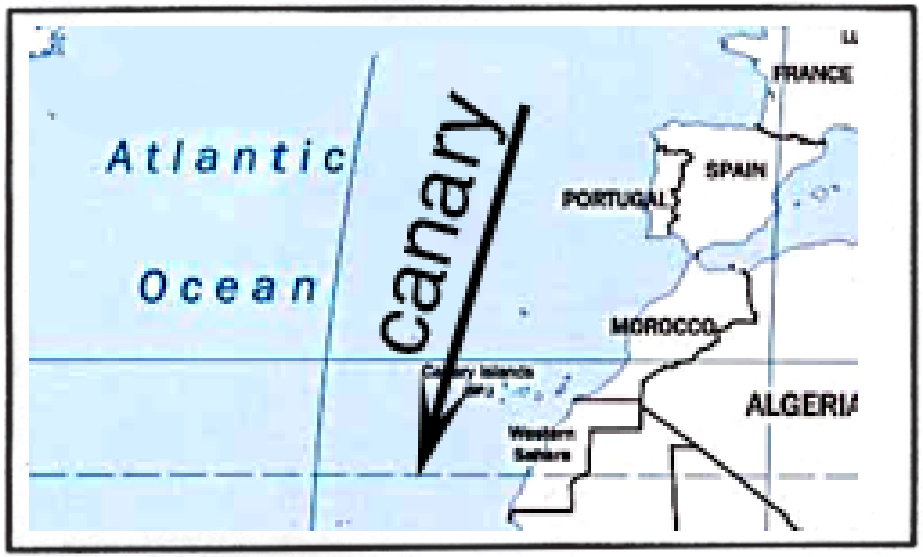

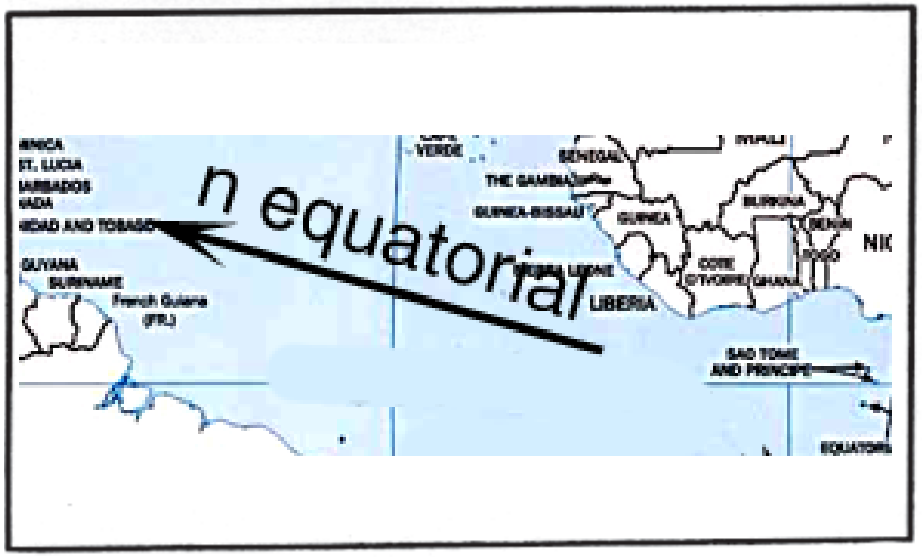

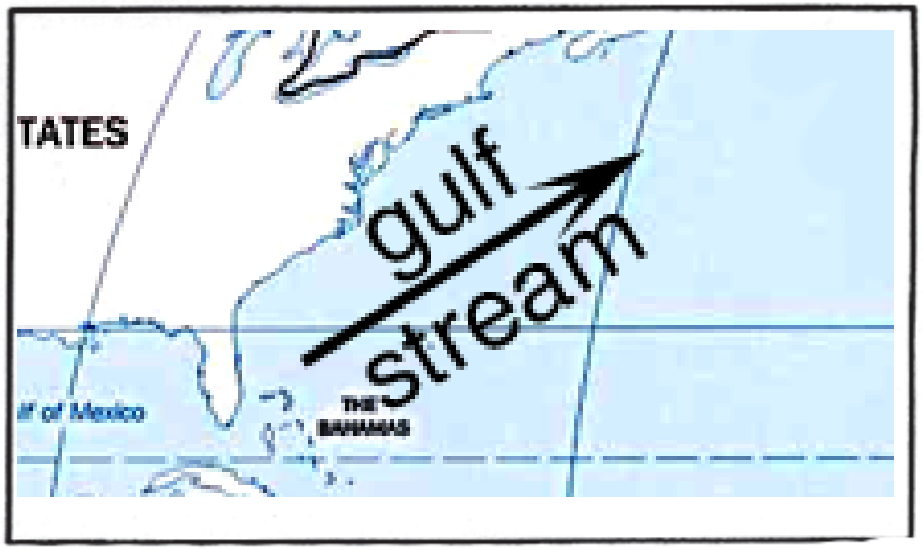

Activity #2 - Wind Driven Ocean Circulation

Global Ocean Basin Chart

base map courtesy of
The General Libraries
University of Texas at Austin
http://www.lib.utexas.edu/maps/

Activity #2 - Wind Driven Ocean Circulation

Major World Ocean Surface Currents