

NAME _____ DATE: _____

CLASS: _____ TEACHER: _____

Earth Science Lab: Drawing and Labeling Planetary Winds

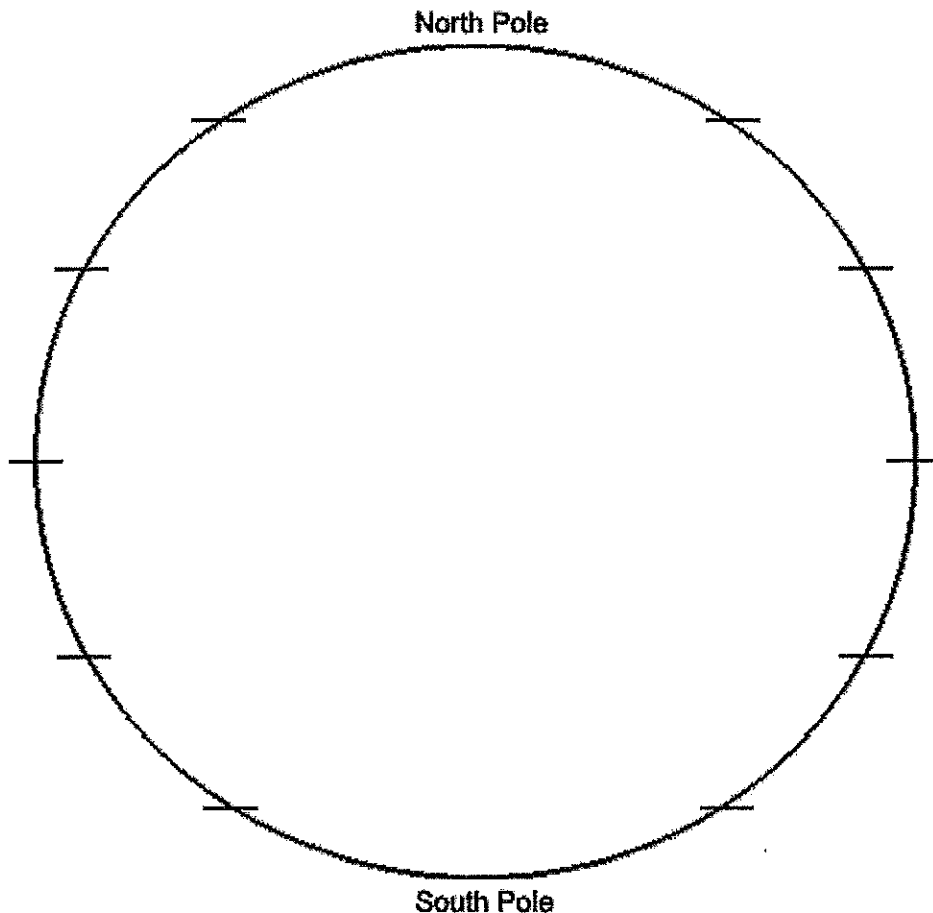
Purpose: To draw Earth's Planetary Wind Belts by carefully following a precise set of directions.

Materials: Ruler, Colored Pencil, New York State Earth Science Reference Tables: *Planetary Wind and Moisture Belts in the Troposphere* (See Page 5).

This printable lab consists of 5 pages.
There is an answer sheet for the lab questions on page 4.

Directions:

1) On the circle below, **connect the tick-marks** on both the left and right sides of the "Earth" with a pencil and ruler.



2) In the **right margin** of your paper label the lines with the following latitude numbers:

0°; 30° N; 30° S; 60° N; 60° S; 90° N; 90° S

3) Write the word "**LOW**" directly on the line representing the equator. This identifies the equator as an area of warm low pressure.

4) Using the words "*High*" and "*Low*", continue identifying the rest of the latitude lines you drew on your circle.

Alternate the words, beginning at the Equatorial Low, then work your way both North, then South, towards each pole.

5) **Draw 3 arrows** in each of the 6 sections on your globe. Make the arrows point from lines representing high {Cold} areas to low {Warm} areas.

6) Using a **colored pencil**, deflect each of the arrows to show how Earth's rotation would affect wind direction.

Remember: winds are deflected to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.

Hint: Look DOWN the arrow TOWARDS the point and then deflect it in the appropriate direction.

7) Using the names that appear below label each of the 6 sections containing deflected arrows to identify that region as one of Earth's "wind belts". Write the label within each different section on the circle.

Remember: Winds are named according to the direction **FROM WHICH** they come.

- Polar Easterlies (Northern and Southern Hemispheres)
- Northeast tradewinds
- Southeast tradewinds
- Prevailing (South) Westerlies
- Prevailing (North) Westerlies

8) Use a **colored pencil** to indicate where the "**mean position of the Polar Jetstream**" is for both the Northern and Southern Hemispheres.

9) On the **right side** of your globe, draw a **Convection Current** showing the pattern of air flow between the 30° N and 60° N latitudes.

PLANETARY WINDS LAB QUESTIONS

Place your Answer to the following questions on the "Answer Sheet" on page 4.

- 1) The deflection of wind, ocean water and objects flying through the air is known as the: _____.
- 2) This deflection is caused by: _____.
- 3) What causes "winds"?
- 4) On a molecular level, explain why cold air is heavier (more dense) and therefore, exerts more pressure than warm air.
- 5) Why then do winds blow from areas of cold, high pressure to areas of low, warm pressure?
- 6) Describe the air mass characteristics (temperature and humidity), for each of the following:
 - a) The equatorial low (0°): _____ & _____
 - b) The 30° N & 30° S subtropical highs: _____ & _____
 - c) The 60° N & 60° S subpolar lows: _____ & _____
- 7) Why is air drier at the 30° N & 30° S and 90° N & 90° S latitudes, while it is wetter at the 60° N & 60° S and 0° latitudes?
- 8a) The drawing you completed for this lab represents the location of wind belts at the time of the Equinoxes.
What will happen to the positions of the Earth's wind belts during of Summer and Winter seasons?
- 8b) Give a good reason why this will happen.



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PLANETARY WINDS LAB ANSWER SHEET

1) _____

2) _____

3) _____

4) _____

5) _____

6)

a- _____ & _____

b- _____ & _____

c- _____ & _____

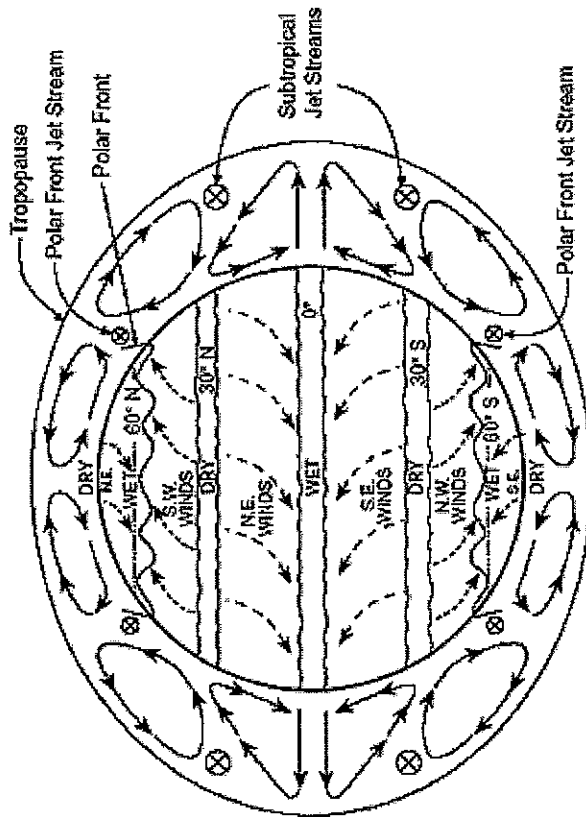
7) _____

8a) _____

8b) _____

Planetary Wind and Moisture Belts in the Troposphere

The drawing to the left shows the locations of the belts near the time of an equinox. The locations shift somewhat with the changing latitude of the Sun's vertical ray. In the Northern Hemisphere, the belts shift northward in summer and southward in winter.



Earth Science Reference Tables — 2001 Edition

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