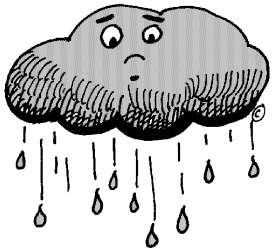
Name _____ Date _____
Mrs. Krieger

AIR MASSES & FRONTS

Introduction:
Though all air looks the same – invisible – it has very different characteristics from place to place. Air masses are large bodies of air that have distinct temperatures and relative humidity. When air masses meet, they do not mix easily. Warmer air masses ride over cooler air masses, and cooler air masses wedge themselves underneath warmer air masses. This happens because cool air is denser than warm air. The boundary that forms between warm and cool air masses is called a front.

Materials:
Corn Syrup
Plastic Container
Moving Masses Model



Procedure:
Part A.

1. Data tables 1 and 2 represent air temperatures in degrees Celsius over a 10 km square area.
2. There are three air masses and two fronts in this area.
3. Data table 2 represents data taken about 10 minutes after the data in Data table 1.
4. Examine Data Table 1. Locate and sketch in the boundaries of the three air masses. *__Remember__, you are looking for boundaries between areas with **noticeably different temperatures**.
5. Label the three air masses using the terms: Cool, medium, and warm.
6. At this point, you do not know what kind of fronts is present.
7. Repeat steps 4 and 5 from Data Table 2. Notice that the fronts have moved.

Data Table 1

14	13	13	15	13	13	15	14	19	19
13	15	14	14	13	14	15	15	20	20
15	14	14	14	15	15	13	18	19	20
15	15	15	14	15	15	21	20	19	20
14	14	15	15	14	20	19	20	20	19
15	16	14	23	23	24	19	20	19	18
23	23	24	22	22	23	24	21	20	20
22	23	24	23	24	23	23	23	20	19
23	24	23	25	25	24	24	24	23	18
22	24	24	24	25	24	23	23	22	17

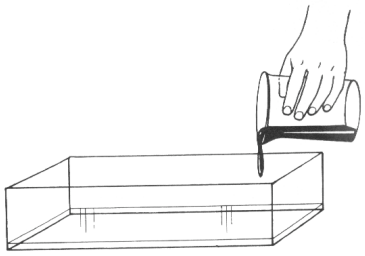
Data Table 2

14	13	13	15	13	13	15	14	15	19
13	15	14	14	13	14	15	15	14	20
15	14	14	14	15	15	13	14	19	20
15	15	15	14	15	15	15	20	19	20
14	14	15	15	14	15	23	20	20	19
15	16	14	14	15	24	24	24	19	18
14	15	15	14	22	23	24	21	23	20
15	23	24	23	24	23	23	23	24	24
23	24	23	25	25	24	24	24	23	24
26	25	26	24	23	25	25	23	24	24

8. Based on the movement of the fronts, and the type of air masses behind them, determine the type of each front (warm or cold).
9. Label the fronts on Data Table 2.

Part B.

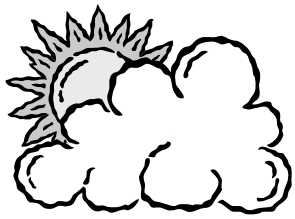
1. Fill the clear container with water to a depth of 3 to 5 millimeters (no deeper!).
2. For this experiment, you will have to work closely with your partner. One person should be the observer, viewing the container at eye level.
3. The other person should pour a slow, steady stream of dark corn syrup into the water at one end of the open container.
4. Quickly observe and sketch the appearance and location of the boundary between the water and the corn syrup.
5. You will make three sketches: once early during the pour, once after the corn syrup is half way poured out of the container, and lastly about a minute after the pour is complete.
6. If time permits, switch jobs and repeat the procedure.



Early in pour	**Late in pour**	**After pour**

Questions:

1. Based on its behavior in the experiment, does the corn syrup behave like a warmer or colder air mass than the water? Explain your answer. _____
   _____
   _____
2. What kind of front did you make with the water and corn syrup: warm or cold? _____
3. Why did the corn syrup slide under the water? _____
   _____



Part C.

1. Take the Moving Masses Model and pull from the right so that you start with Monday morning.
2. Describe the first type of cloud to appear on Monday morning. _____
   _____
3. What did the clouds look like by Tuesday morning when they were producing rain? _____
4. Why did the warm air rise up over the cold air on Monday? _____
   _____
5. Describe the type of clouds present as the cold front moved in on Wednesday morning. _____
   _____

Challenge:

If you saw thin wispy clouds followed by lower layered clouds, what type of weather might you expect in the near future? _____
_____
_____