

Air Masses and Fronts

Activity Guide Component → 8.3.3, 8.3.4, & 8.3.5

Guiding Questions (be able to answer these questions at the end of packet)

1. How are air masses formed?
2. What are the differences between each of the four air masses? (Mention name, characteristics, and location)
3. What are the three air fronts and what are characteristics of each?
4. What data can be used to identify when a front occurred?



Agenda (fill in the squares and circles as you complete everything on the agenda)

- ☐ **Air Masses Notes → 7 Minutes → Page 2**
 - Watch the air masses video. Make sure you follow along.
- ☐ **Air Masses Notes Review Cut and Paste → 5 Minutes → Page 3**
 - Cut out the air masses and paste them onto the map. Clean up after yourself!
- ☐ **Air Masses Labeling Worksheet → 7 Minutes → Page 4**
 - Fill out the chart using the notes as a reference
 - Check your packet with your teacher
- ☐ **Air Front Lab → 10 Minutes → Page 5**
 - Complete the air front lab and analysis questions. Clean up after yourself!
- ☐ **Air Front Computer Interactive → 20 Minutes → Page 6**
 - Complete the Air Front Computer Interactive
- ☐ **Air Front Notes → 10 Minutes → Page 7**
 - Watch the air front notes. Make sure you follow along.
- ☐ **Air Front Worksheet → 5 Minutes → Page 8**
 - Complete the air front worksheet
- ☐ **Air Masses and Fronts Review Worksheet → 7 Minutes → Page 9**
 - Complete the air masses and fronts review. Check in packet with the teacher
- ☐ **Guiding Questions → 6 Minutes → Page 10**
 - Answer the guiding questions
- ☐ **Air Masses and Fronts Quiz → 10 Minutes → _____**
 - Give your teacher your packet and take the quiz.

70% or Above	69% or Under
• Move on to the Study Guide	• Ask any questions you might have • Retake the quiz TOMORROW

Unit Test will cover 4 activities: Water Cycle, Air Pressure / Winds, Air Masses / Fronts and Weather Data
FILL IN THE FOLLOWING DATES: _____

Unit study guide due: _____

Unit test over 4 packets is on: _____

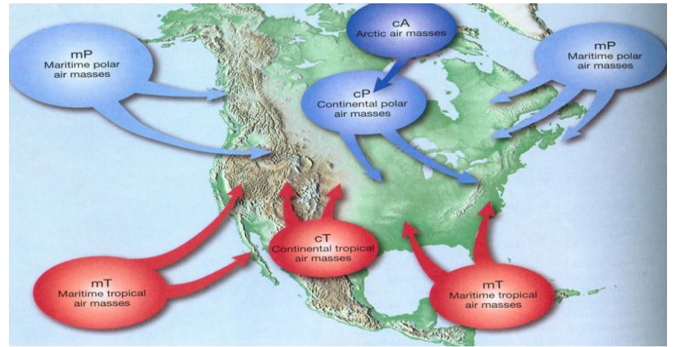
AIR MASS NOTES

What are air masses?

- Large Bodies of air
- Form when the air over a large region sits in one place for many days
- The air gradually takes on the characteristics of the land or water below it

How do air masses affect our weather?

- As an air mass moves, it brings its characteristics with it
- Changes weather



What are the two characteristics that describe air masses?

- Two words each
 - One for moisture
 - One for temperature

When describing moisture what words can we use?

- The first word of an air mass tells one where the mass was formed (over water or land)
- **Continental**
 - Air masses formed over **land**
 - **DRY**
- **Maritime**
 - Air masses formed over **water**
 - **WET**



When describing temperature what words can we use?

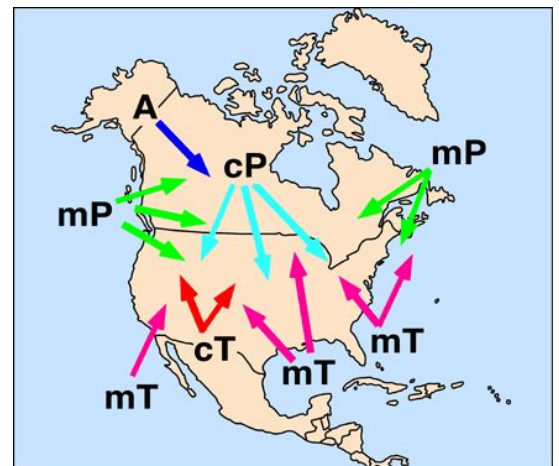
- The second word of an air mass tells whether an air mass was formed close to the equator or pole
- **Tropical**
 - Air masses formed near the **equator**
 - **WARM AIR**
- **Polar**
 - Air masses formed closer to the **poles**
 - **COLD AIR**

What are the 4 Major Air Masses?

- The four major air masses are:
 - Maritime Tropical (moist warm air)
 - Continental Tropical (dry warm air)
 - Maritime Polar (moist cold air)
 - Continental Polar (dry cold air)

What moves air masses?

- Winds
- Air masses can travel away from the regions where they form
 - Can move with global winds and jet streams
- As the air mass moves it changes



CODE WORD: _____
 **You *MUST* watch and listen to the entire video to get the code word

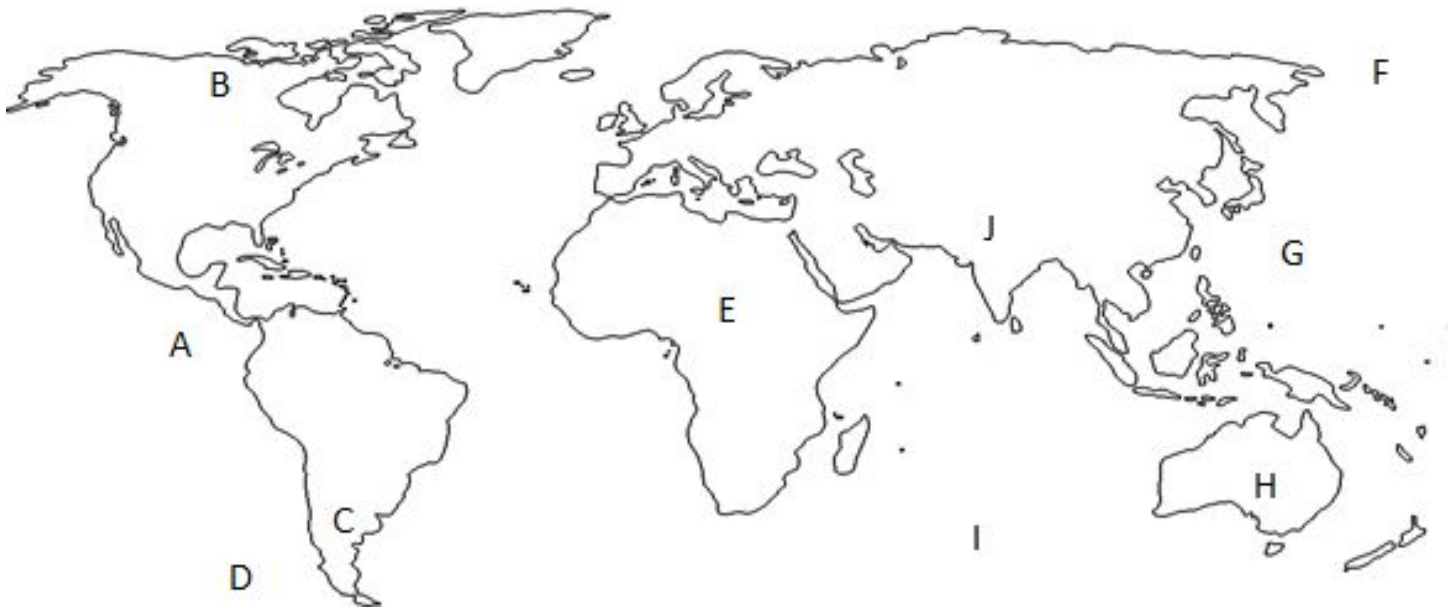
Notes Review Page



See your teacher for the air masses to cut out and paste onto your paper

Name: _____ Period: _____

Air Mass Worksheet



Letter	Temperature (Hot or Cold)	Moisture (Dry or Moist)	<i>Air Mass Name</i> (Maritime Tropical, Maritime Polar, Continental Tropical, Continental Polar)
A			
B			
C			
D			
E			
F			
G			
H			
I			
J			

Air Fronts Lab

Procedure:

1. Fill the rectangle plastic container $\frac{1}{4}$ way full of water
2. Fill a small beaker of blue COLD water $\rightarrow \frac{3}{4}$ Full (ask the teacher if you need an ice cube)
3. Fill a small beaker of red WARM water
4. On the LEFT SIDE stand the blue beaker of water in the container of water you filled in step 1
5. On the RIGHT SIDE Stand the red beaker of water in the container of water you filled in step 1
6. Slowly tip both beakers over (at the same time) so the warm and cold water spills out
7. Draw what happens at the beginning and at the end
 - **Look at the container at eye level**
 - Color your drawing
8. Clean up your lab station by pouring the plastic container of water into the sink
9. Rinse out the container and the beakers
10. Answer the analysis questions below

Drawings

Beginning (First 5 seconds)	End (After 30 seconds)

Analysis Questions

1. Describe the density and the temperature of the blue ice cube
2. Describe the density and the temperature of the red water
3. Explain what happened in this lab. Why did the waters behave like they did? MENTION DENSITY
4. Air fronts occur when two air masses meet. Which air mass would go on top of the other? Tropical or Polar? Why?

Air Front Computer Interactive

Procedure: Go to http://www.phschool.com/atschool/phsciexp/active_art/weather_fronts/ (also found on the website) and complete the following chart.

★ **MAKE SURE YOU READ THE TEXT AT THE TOP OF THE PAGE AND WATCH THE MOVEMENT ON THE INTERACTIVE**

Introduction

1. What is an air front?

2. What does an air front often cause? (2 things)
 -

 -

Front	What Type of Air Mass Is Moving In?	Which Air Mass Goes On Top and Why	Type of Cloud	Weather Caused	Picture At the End (Include labels, clouds, and precipitation)
Cold Front					
Warm Front					
Stationary Front					

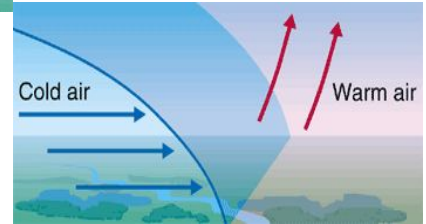
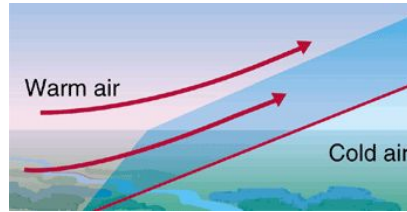
AIR FRONT NOTES

What is it called when 2 air masses meet?

- Front

What happens at a front?

- Weather Changes
- Clouds and precipitation are often formed



What are the three different types of fronts?

- Cold Front
- Warm Front
- Stationary Front

	Cold Front	Warm Front	Stationary Front
Description (State what type of air mass meets the other type of air mass)	• Mass of cold, dense air moves in • Warmer air ahead of it is pushed upward (its less dense) and condenses forming precipitation	• Mass of warm air moves in • Warm air moves above/on top the cold air (it's less dense) • Moisture in the warm air condenses, producing cloud-covered skies.	• Occurs when air masses meet and stop moving. • The air can still move sideways • Whatever front advances first decides which it will be
Weather that occurs at the boundary	Heavy Storms	Hours of rain or snow	X
What type of cloud do you find at the front?	Cumulonimbus	Cirrus and Stratus	Cirrus and Stratus
Weather you will find after	Cool and Clear Skies	Warmer Weather	Either the weather of a warm front or a cold front
Ways to identify that the front is occurring	• Heavy Storms Occur • Temperature Drops • Barometric Pressure Drops	• Steady Rain Occurs • Temperature Increases • Barometric Pressure Drops	X
Picture			

Air Fronts Worksheet

CODE WORD: _____
**You *MUST* watch and listen to the entire video to get the code word

1. Examine the following diagram and answer the following questions.



What type of front is illustrated?

How did you identify this front?

2. Explain why warm air is pushed up by the cold front.

3. Where are clouds formed when there is a cold front?

4. Examine the following diagram and answer the following questions.



What type of front is illustrated?

How did you identify this front?

5. What happens to the warm air when it overtakes the cold air?

6. Where do clouds form when there is a warm front?

AIR MASSES AND FRONT REVIEW WORKSHEET

Circle the correct answer in the table below

Type	Where it Forms (Circle over ocean or land)	Temperature (Circle warm or cold)	Humidity (Circle moist or dry)
Continental Polar (CP)	over ocean over land	warm cold	moist dry
Continental Tropical (CT)	over ocean over land	warm cold	moist dry
Maritime Polar (MP)	over ocean over land	warm cold	moist dry
Maritime Tropical (MT)	over ocean over land	warm cold	moist dry

Complete the table below with image on the right

Letter	Temperature (Cold, Warm)	Humidity (Dry, Moist)	Name of Air Mass (CT, CP, MT, MP)
A			
B			
C			
D			
E			



Select C, W, or S to identify the type of front the statement describes.

C = Cold Front

W = Warm Front

S = Stationary

- _____ 1. Barometric pressure drops significantly.
- _____ 2. Cool air mass is in place - warm air mass moves in.
- _____ 3. Warm air mass is in place - cool air mass moves in.
- _____ 4. Brings gentle rain that may last for hours or days.
- _____ 5. Neither air mass moves.
- _____ 6. Strong winds are formed followed by heavy rain, crashing thunder, and flashing lightning.
- _____ 7. When the front passes, the temperature warms up and it becomes humid.
- _____ 8. When the front passes, the weather turns cooler.

Name: _____ Period: _____

_____ 9. Air masses move sideways.

GUIDING QUESTIONS

1. How are air masses formed?

2. What are the differences between each of the four air masses? (Mention name, characteristics, and location)

Air Mass	Location Formed	Characteristics

3. What are the three air fronts and what are characteristics of each?

Air Front	Air Mass Movement	Ways to Identify Front is Occurring	New Weather Characteristics
Cold Front			
Warm Front			
Stationary Front		X	

4. What data can be used to identify when a front occurred?

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Name: _____ Period: _____

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