

AIM | What makes air pressure 5 | change?

Where is air pressure higher, Mount Everest or Death Valley? Death Valley is *below* sea level. It has higher air pressure.

But, air pressure can change even *without* going from mountains to valleys.

Two other things can change air pressure. They are *temperature* and the *amount of water vapor in the air*.

TEMPERATURE Heat makes air molecules move faster. As they move faster, the molecules spread farther apart. A container of warm air has *fewer* molecules in it than an equal container of cool air.

Fewer molecules mean less weight. And less weight means less pressure.

WARM AIR WEIGHS LESS THAN COOL AIR.

WARM AIR HAS LESS PRESSURE THAN COOL AIR.

AMOUNT OF WATER VAPOR Water vapor weighs *less* than most of the other gases of the air.

Each molecule of water vapor that goes into the air pushes aside some other air molecule.

Usually, a heavier molecule is pushed aside. This makes the air lighter.

MOIST AIR WEIGHS LESS THAN DRY AIR.

MOIST AIR HAS LESS PRESSURE THAN DRY AIR.

LET'S REVIEW

Review what you learned about air pressure in Aim 4. Look at Figure A. Then answer the questions. Write the correct letter in the blank spaces.

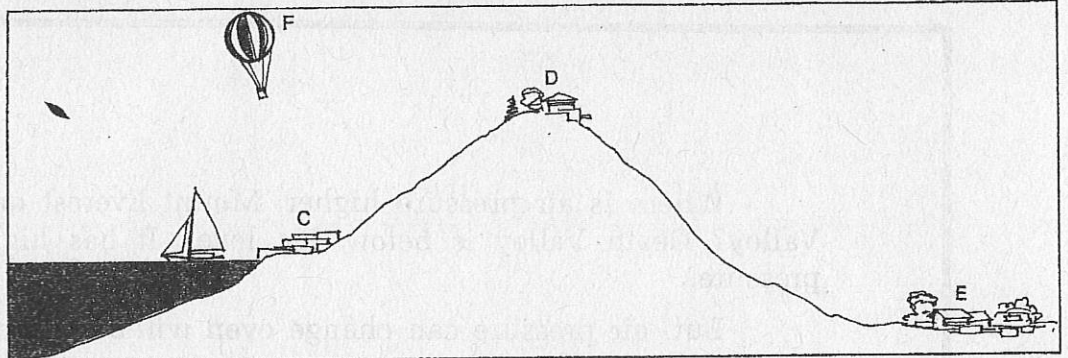


Figure A

1. Air molecules are closest together at _____.
2. Air molecules are furthest apart at _____.
3. Air pressure is greatest at _____.
4. Air pressure is least at _____.

TEMPERATURE CHANGES AIR PRESSURE

Study Figures B and C. Then answer the questions with B or C.

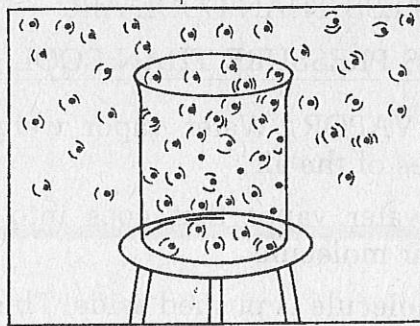


Figure B

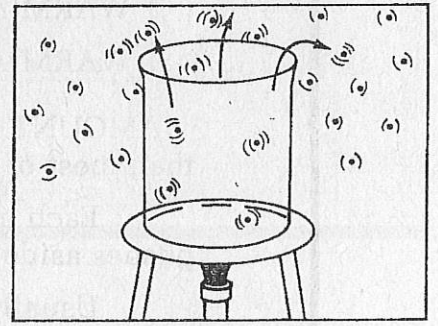


Figure C

1. Which beaker has the warmer air? _____
2. Which beaker has the cooler air? _____
3. Which beaker has more air molecules? _____
4. Which beaker has fewer air molecules? _____
5. Air is lighter in beaker _____.
6. Air is heavier in beaker _____.
7. Air pressure is greater in beaker _____.
8. Air pressure is less in beaker _____.

MOISTURE CHANGES AIR PRESSURE, TOO

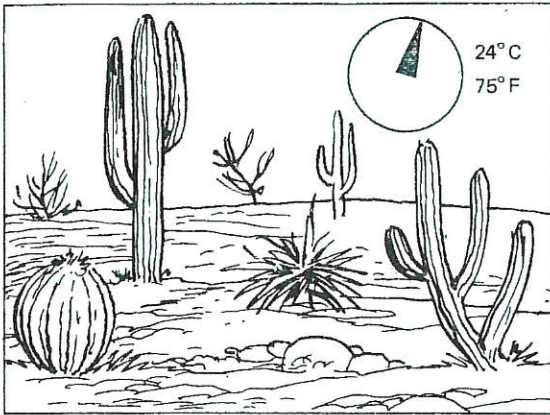


Figure D

Sandy Desert



Figure E

Ferny Rain Forest

These two places are both at sea level.

1. The air in Figure _____ has a lot of water vapor.
2. The air in Figure _____ has very little water vapor.
3. Which air is heavier? _____
4. Which air is lighter? _____
5. Air pressure is greater in _____.
6. Air pressure is weaker in _____.

ABOUT BAROMETERS

Air pressure can be measured with a barometer. A simple barometer can be made like this: Pour mercury into a bowl.

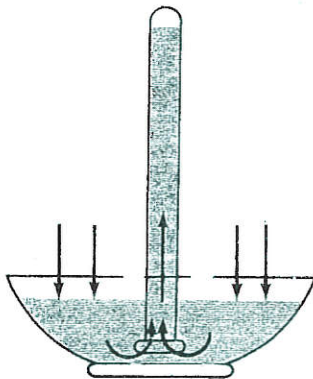


Figure F

Fill a glass tube that is at least 85 cm (31 inches) long with mercury. Hold a finger over the open end of the tube. Turn the tube upside down. Then put its open end (where your finger is) into the mercury of the bowl.

The level of the mercury column in the tube will drop a little. The level will drop until there is a column of mercury 76 cm (about 30 inches) above the surface of mercury in the bowl.

The pressure of the air presses down on the mercury in the bowl. This pressure supports, or holds up, the weight of the mercury in the tube. When the air pressure increases, the mercury in the tube rises a little. When the air pressure decreases, the mercury in the tube falls a little.

Another barometer is the *aneroid* [AN uh roid] *barometer*.

This is the barometer that is commonly used to measure air pressure.

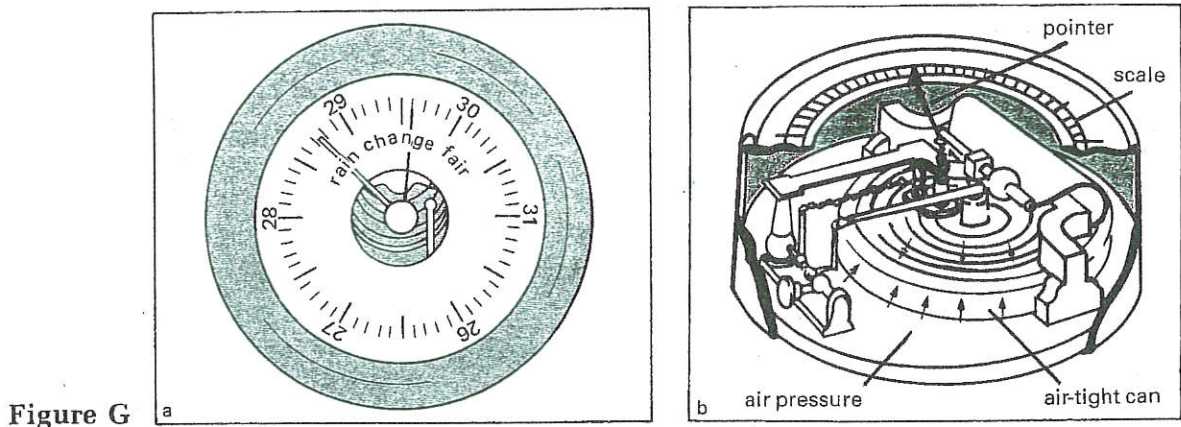


Figure G

The aneroid barometer is made of a small drum that has almost no air in it. The drum is "squeezed" when the air pressure is high. It gets bigger when the air pressure is low.

A spring connects the small drum to a scale that can be read.

COMPLETING SENTENCES

Complete the sentences with the choices below. One of these may be used twice.

molecules
less
temperature
gases

how high up you are
atoms
barometer
amount of water vapor in the air

presses
weight
moist
higher

1. The atmosphere is a mixture of _____.
2. Gases are made up of _____ and _____.
3. Atoms and molecules have _____.
4. Anything that has weight also _____ against things.
5. Three things that can change air pressure are: _____,
_____ and _____.
6. Air pressure becomes weaker the _____ you go.
7. Usually, warm air presses _____ than cool air.
8. Moist air weighs _____ than dry air.
9. A word that describes air with a lot of water vapor is _____.
10. The instrument that measures air pressure is called a _____.

CHOOSE Choose the correct word to complete each statement. Underline
ONE the correct word in each sentence below.

1. Molecules move faster in (warm, cool) air.
2. Air that is warm takes up (more, less) space than cool air.
3. Warm air weighs (more, less) than cool air.
4. Warm air presses (more, less) than cool air.
5. Water vapor is a (liquid, gas).
6. Water vapor molecules weigh (more, less) than most other gases of the air.
7. Moist air is (heavier, lighter) than dry air.
8. Moist air presses (more, less) than dry air.
9. The higher you go, the (more, less) air there is.
10. Air pressure is (greater, less) on a mountain than at sea level.

REACHING OUT

1. Why do mountain climbers have trouble breathing on high mountains?

2. Mountain A and Mountain B are the same height. At their tops the temperatures are the same. But Mountain B is covered by very moist air. Which mountain has the greater air pressure? Why?
