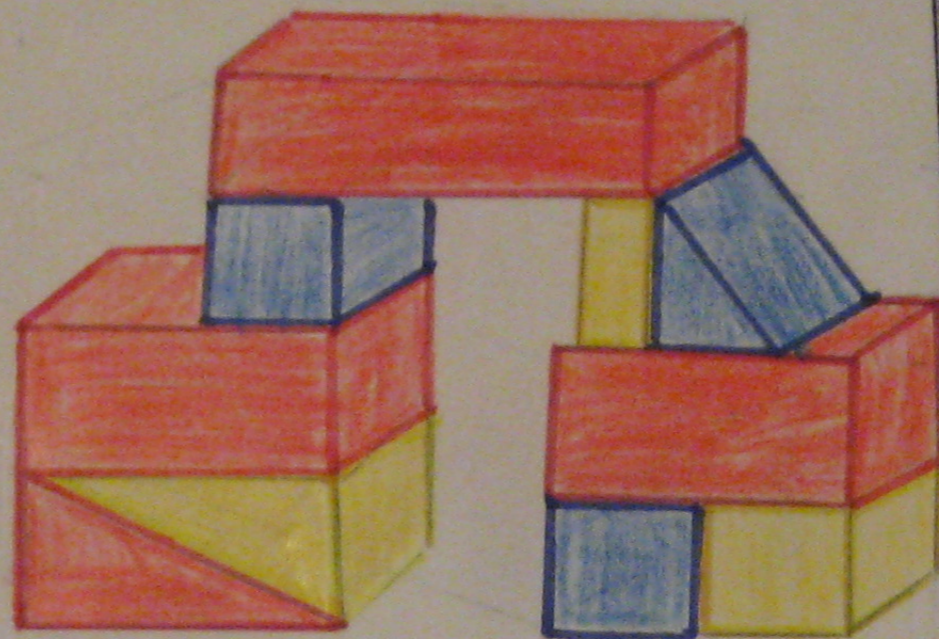


THE PARTICLE THEORY

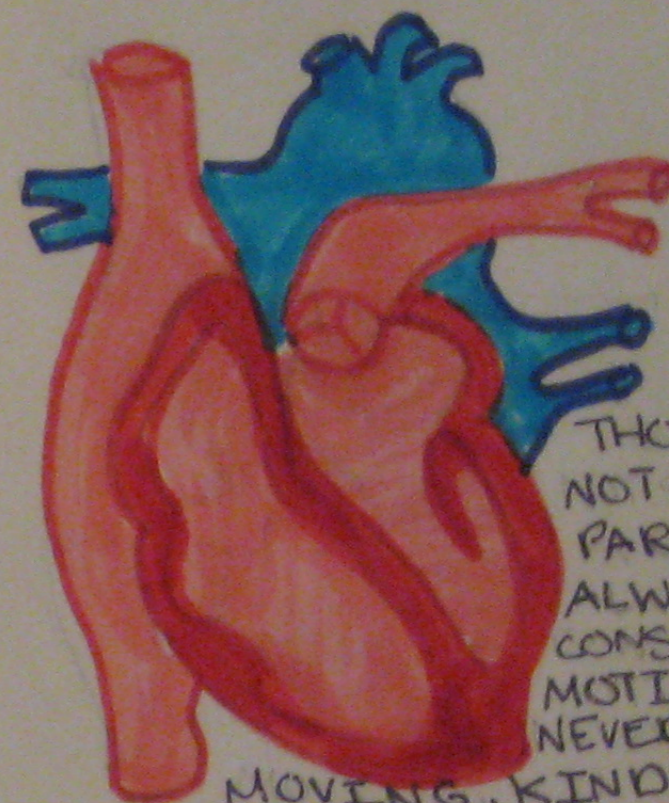
BY: ILLA



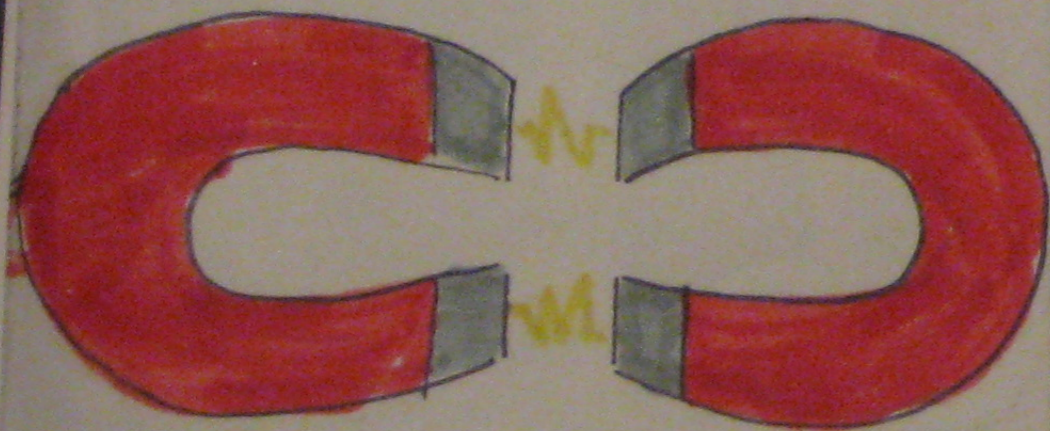
EVERYTHING ON PLANET EARTH IS MADE UP OF TEENY, TINY PARTICLES CALLED MATTER AND ARE ALSO CALLED ATOMS OR MOLECULES. THEY ARE FAR TOO SMALL TO SEE THROUGH THE NAKED EYE BUT CAN BE SEEN THROUGH EXTREMELY STRONG TELESCOPES



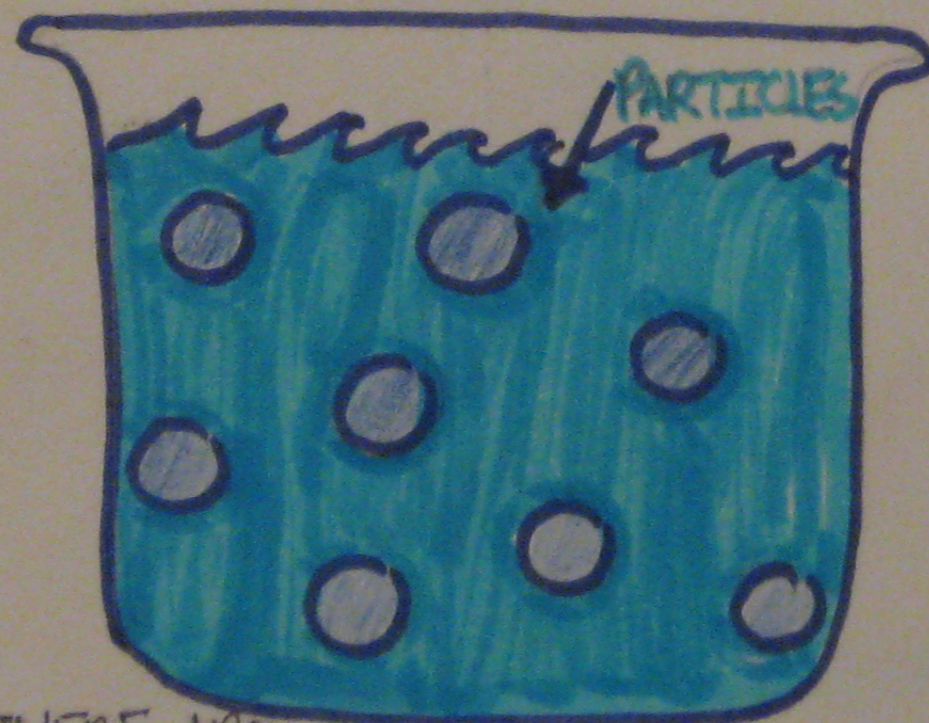
MATTER IS THE BUILDING BLOCK OF EVERYTHING, KIND OF LIKE TINY PIECES OF LEGO.



THOUGH WE CAN NOT SEE IT, PARTICLES ARE ALWAYS IN CONSTANT MOTION, AND NEVER STOP MOVING, KIND OF LIKE HOW YOUR HEART NEVER STOPS BEATING.



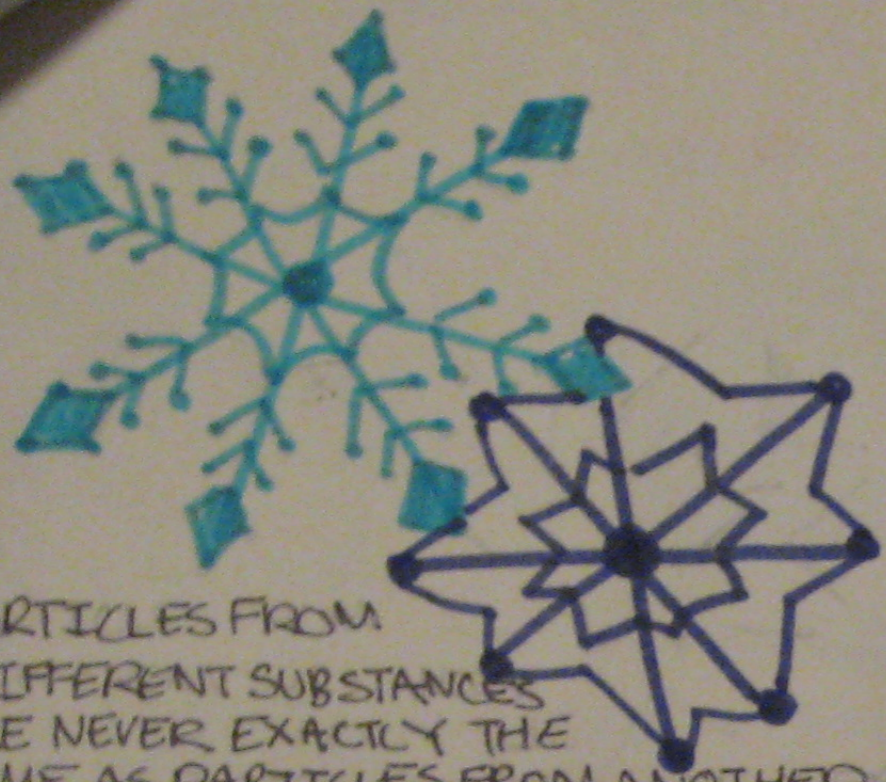
PARTICLES OF MATTER ARE HELD TOGETHER BY EXTREMELY STRONG ELECTRIC FORCES, KIND OF LIKE SUPER STRONG MAGNETS.



THERE ARE EMPTY SPACES BETWEEN THE PARTICLES, WHICH ARE VERY LARGE COMPARED TO THE PARTICLES THEMSELVES

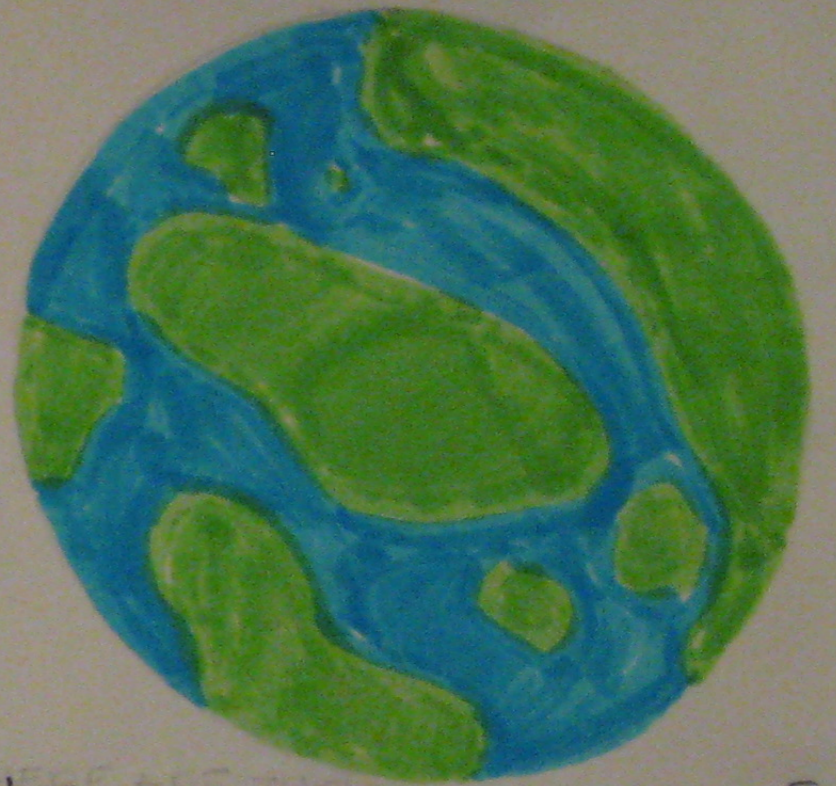
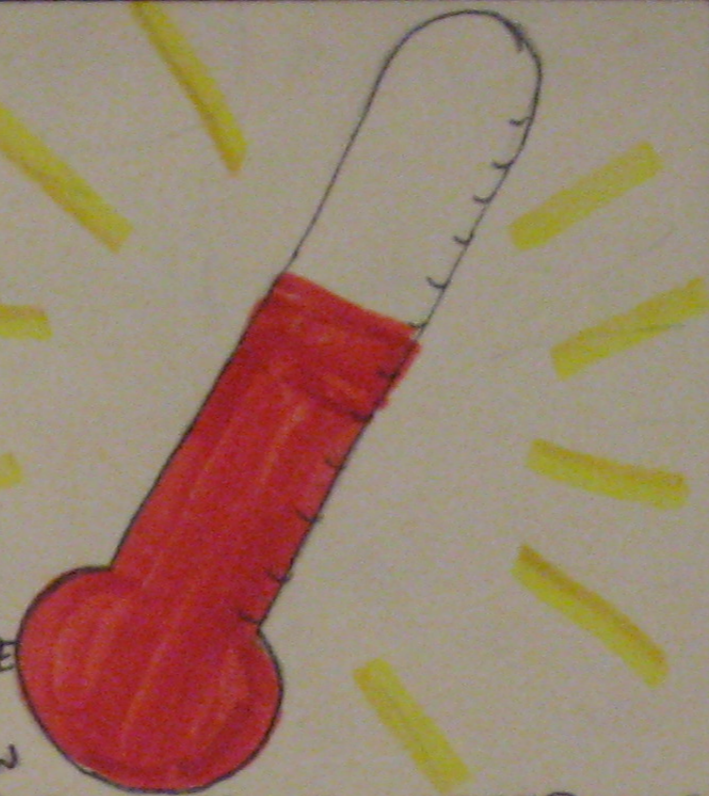


THOUGH ALL PARTICLES FROM ONE SUBSTANCE ARE EXACTLY THE SAME, KIND OF LIKE IDENTICAL TWINS...



PARTICLES FROM DIFFERENT SUBSTANCES ARE NEVER EXACTLY THE SAME AS PARTICLES FROM ANOTHER SUBSTANCE AND ARE UNIQUE, KIND OF LIKE HOW NO TWO SNOWFLAKES ARE THE SAME

TEMPERATURE PLAYS A KEY ROLE IN HOW FAST THE PARTICLES OF MATTER MOVE. THE MORE HEAT ENERGY THE PARTICLES HAVE, THE FASTER THEY MOVE, BUT THE LESS HEAT ENERGY THE PARTICLES HAVE, THE SLOWER THEY MOVE



THERE ARE THREE TYPES OF MATTER ON EARTH'S SURFACE....



SOLIDS, LIKE THE HARD GROUND UNDER OUR FEET...

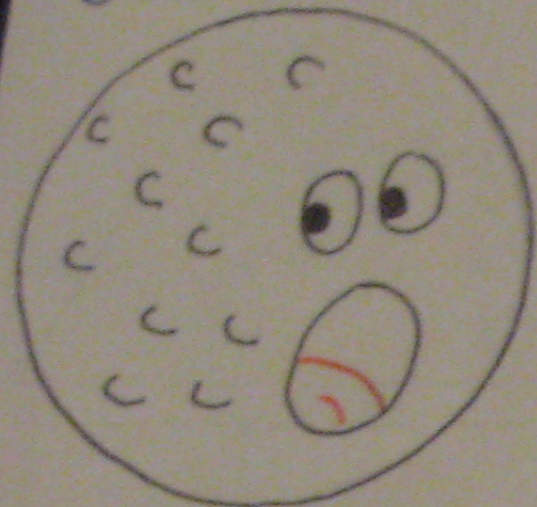
LIQUIDS, LIKE THE OCEANS AND SEAS



AND GASSES, LIKE THE AIR THAT WE BREATHE!

DENSITY MEASURES HOW PACKED TOGETHER THE PARTICLES IN A SUBSTANCE ARE.

GOLF BALL



WATER-FILLED PING-PONG BALL

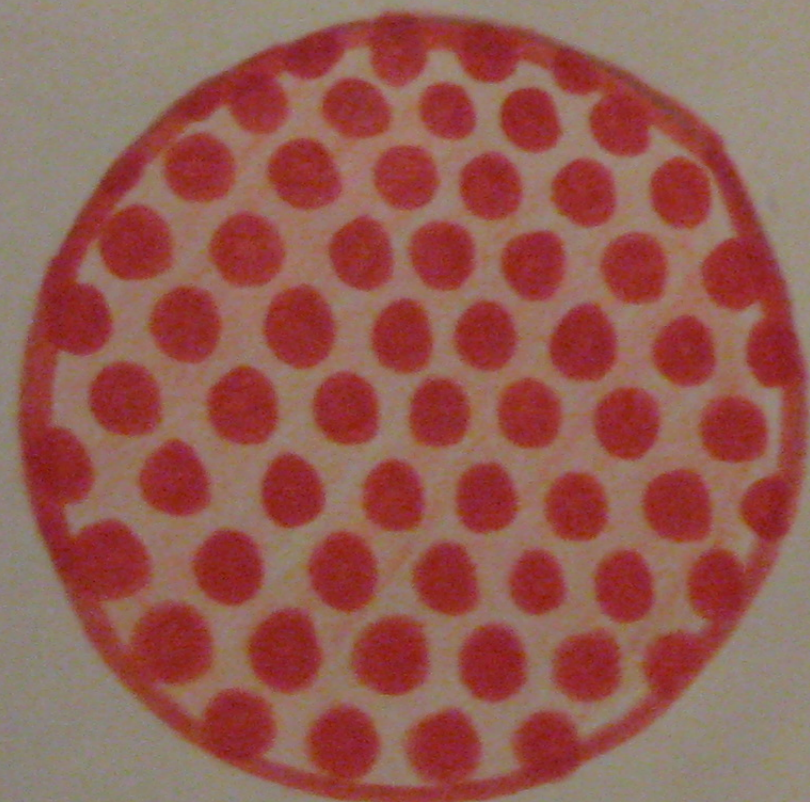
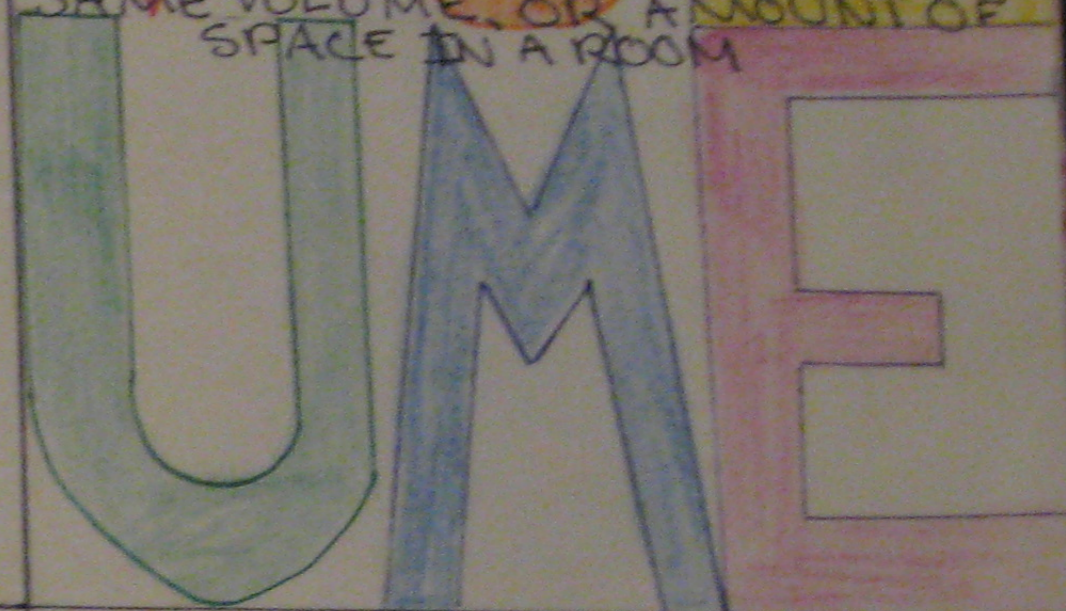


AIR-FILLED PING-PONG BALL

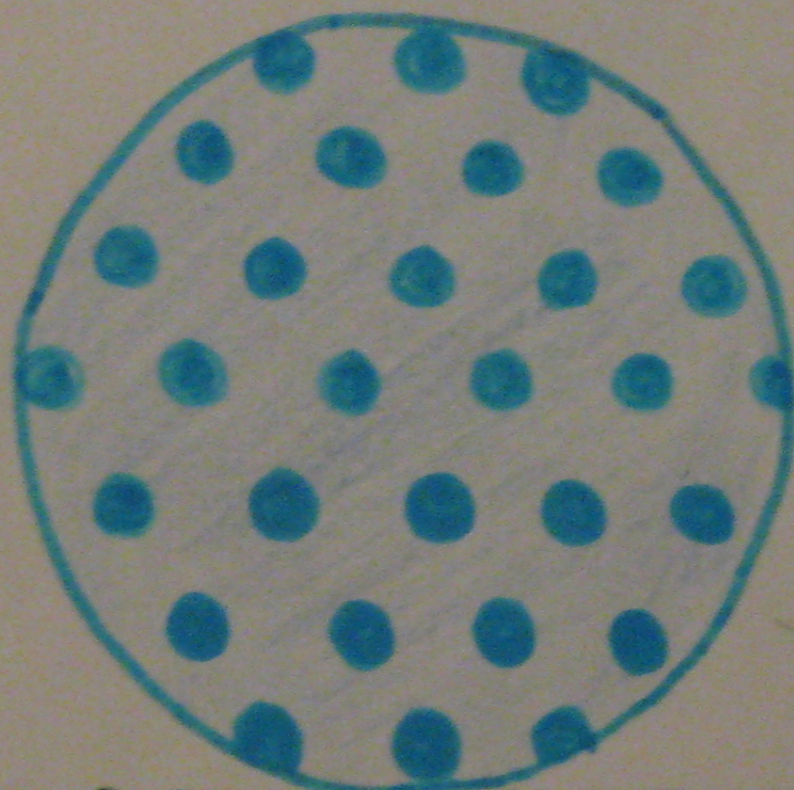


IMAGINE A GOLF BALL, A PING PONG BALL FILLED WITH WATER, AND A PING-PONG BALL FILLED WITH AIR

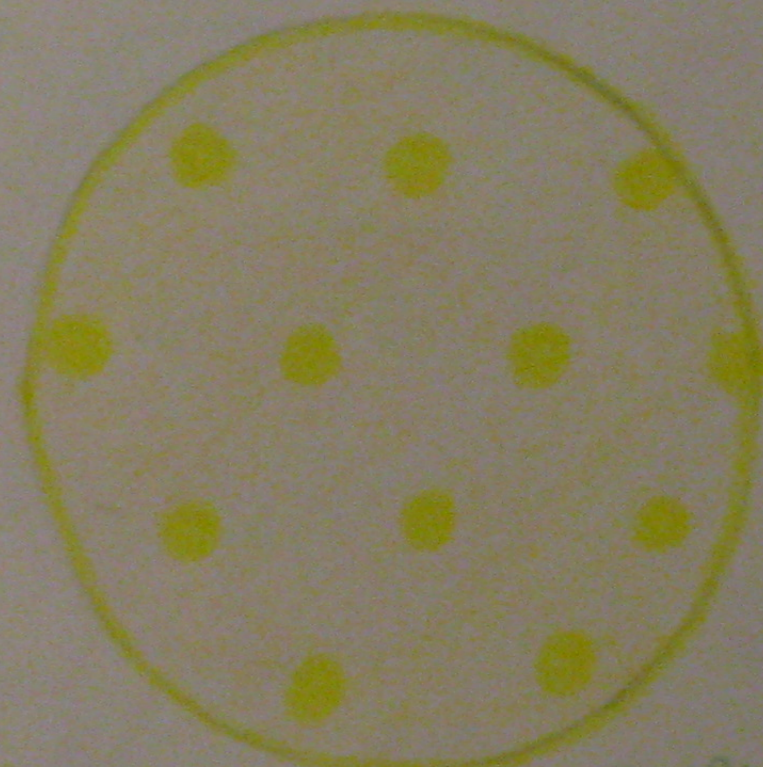
ALL THREE BALLS TAKE UP THE SAME VOLUME, OR AMOUNT OF SPACE IN A ROOM



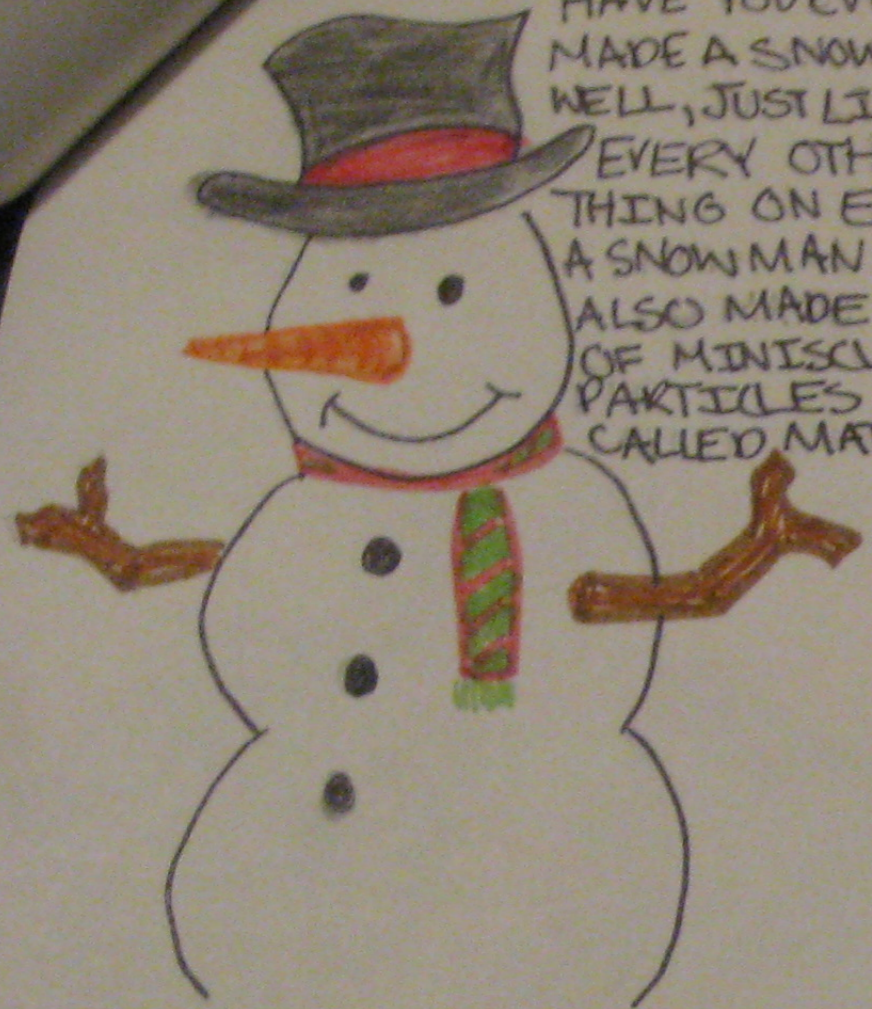
HOWEVER THE PARTICLES IN A GOLF BALL ARE LIKE THE PARTICLES IN A SOLID AND HAVE A VERY HIGH DENSITY BECAUSE THE PARTICLES ARE PACKED CLOSELY TOGETHER



THE PARTICLES IN THE WATER FILLED PING-PONG BALL ARE LIKE THE PARTICLES IN A LIQUID AND HAVE A LOWER DENSITY THAN THE GOLF BALL BECAUSE THE PARTICLES ARE PACKED FAIRLY CLOSE TOGETHER.



THE PARTICLES IN A NORMAL AIR FILLED PING-PONG BALL ARE LIKE THE PARTICLES IN A GAS AND HAVE AN EXTREMELY LOW DENSITY BECAUSE THE PARTICLES ARE NOT PACKED CLOSE TOGETHER.



HAVE YOU EVER MADE A SNOWMAN? WELL, JUST LIKE EVERY OTHER THING ON EARTH, A SNOWMAN IS ALSO MADE UP OF MINISCULE PARTICLES CALLED MATTER.

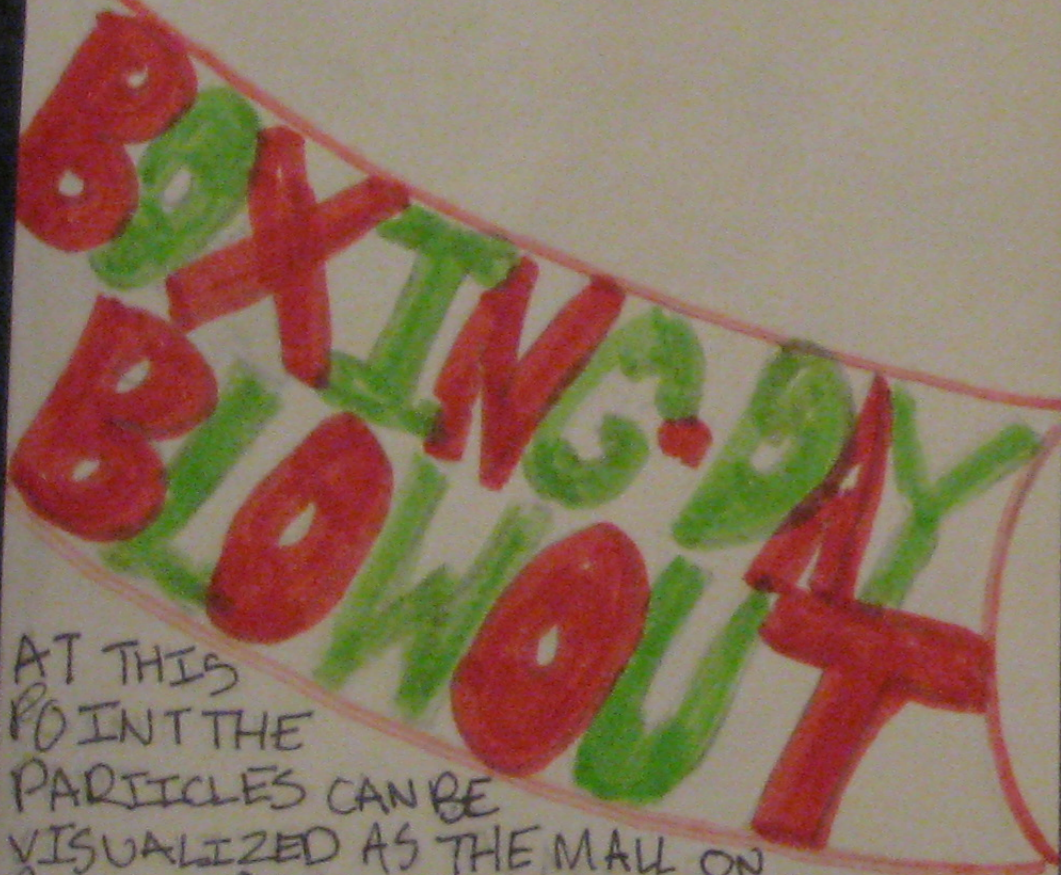


ALL OF THE PARTICLES THAT MAKE UP A SNOWMAN ARE EXACTLY ALIKE AND ARE IN CONSTANT MOTION. WHEN A SNOWMAN IS IN THE STATE OF A SOLID PARTICLES ARE PACKED CLOSELY TOGETHER AND ARE MOVING QUITE SLOWLY AND HAVE LIMITED HEAT ENERGY BUT WHY ARE THEY LIKE THIS?

WHEN YOU SPEND TIME OUTSIDE ON A FREEZING COLD WINTER DAY, YOUR BODY TEMPERATURE DROPS AND YOU BEGIN TO FEEL COLD. TO TRY TO REGAIN YOUR BODY HEAT YOU HUDDLE TOGETHER WHICH IS KIND OF WHAT THE PARTICLES IN A SOLID DO AS WELL SO THEY MOVE CLOSER TOGETHER AS THEY HAVE A SMALL AMOUNT OF HEAT ENERGY.



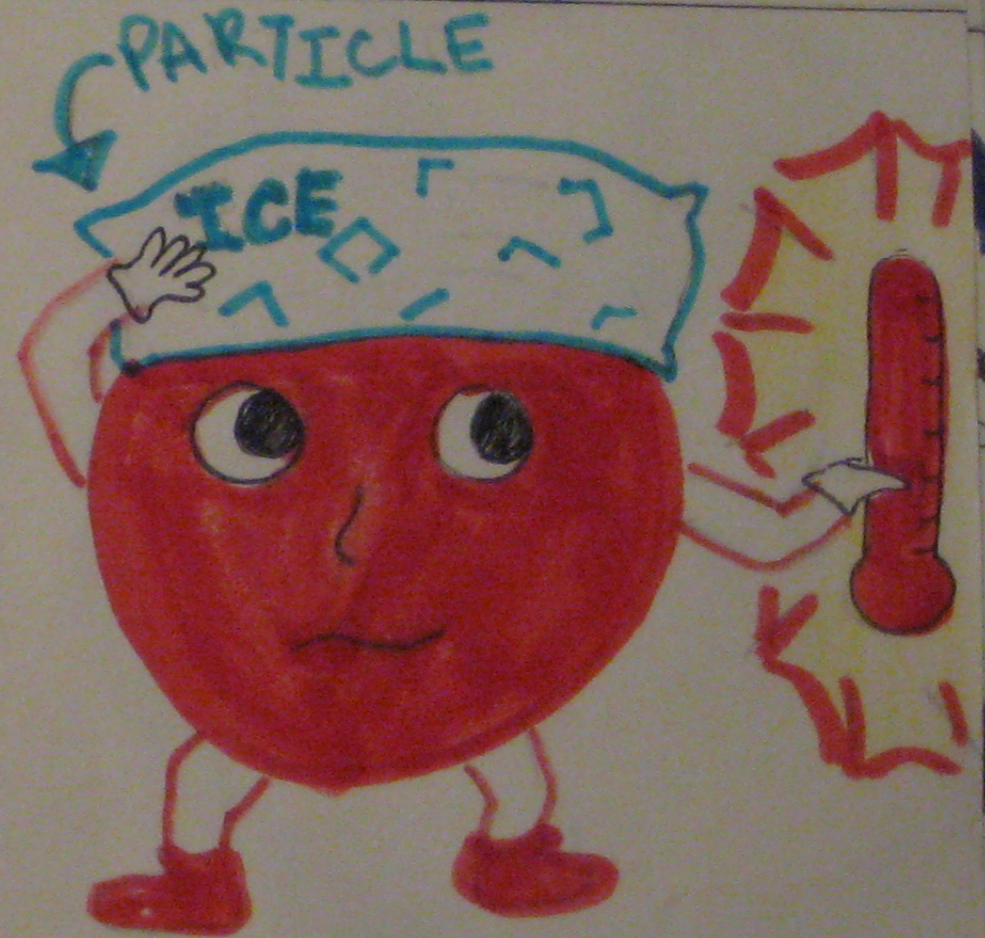
BURR!



AT THIS POINT THE PARTICLES CAN BE VISUALIZED AS THE MALL ON BOXING DAY, WHEN THE MALL BECOMES JAM-PACKED WITH PEOPLE WHICH ARE LIKE THE MOLECULES, AND YOU ARE FORCED TO MOVE THROUGH THE MALL VERY SLOWLY AND WITHOUT MUCH FREE SPACE AT ALL.



GRADUALLY, AS THE SUN BEGINS TO PEAK OUT FROM BEHIND THE CLOUDS AND SHINES DOWN ON THE SNOWMAN AND AS THE PARTICLES COLLECT HEAT ENERGY THE SNOWMAN BEGINS TO MELT.

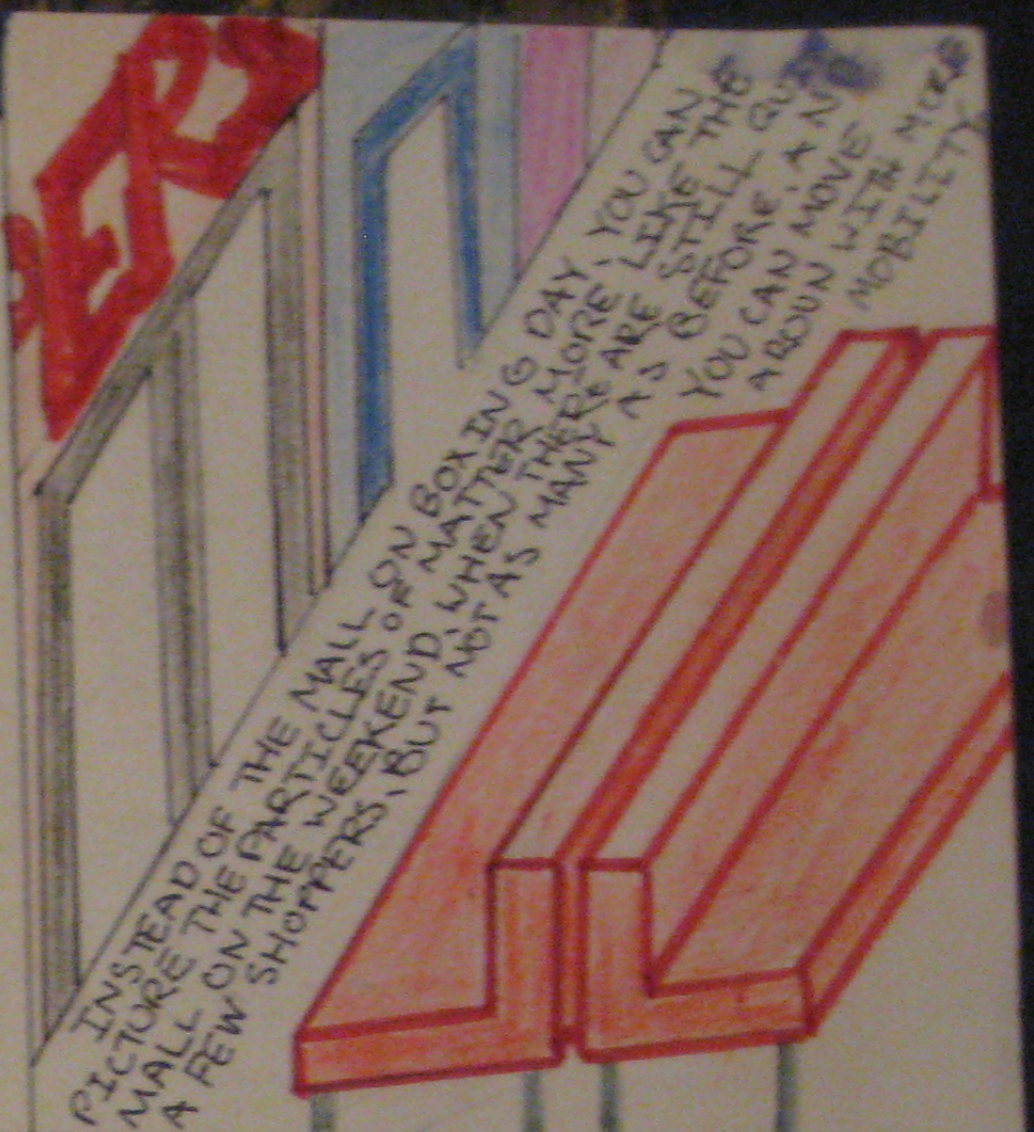
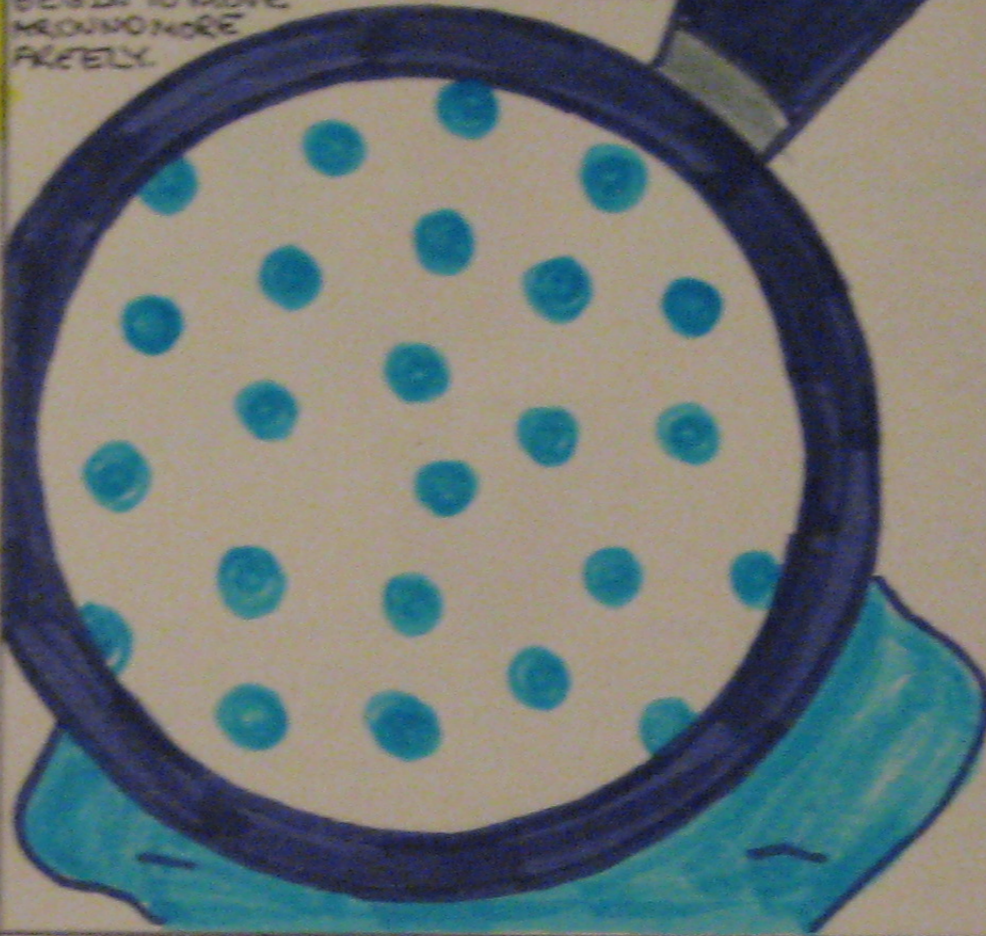


AS THIS PROCESS TAKES PLACE THE VOLUME INCREASES AND THE TEMPERATURE OF THE PARTICLES GROW.

Finally the poor snowman has entirely melted and is nothing more than a lonely puddle. Now the snowman has reached the second stage of matter and is a liquid.



BECAUSE THE TEMPERATURE HAS RISEN AND THEY HAVE MORE HEAT ENERGY AND THE MOLECULES HAVE BECOME LESS COMPACTED TOGETHER, OR IN OTHER WORDS THE SPACES BETWEEN THE PARTICLES ARE BIGGER, AND THE PARTICLES BEGIN TO MOVE AROUND MORE FREELY.

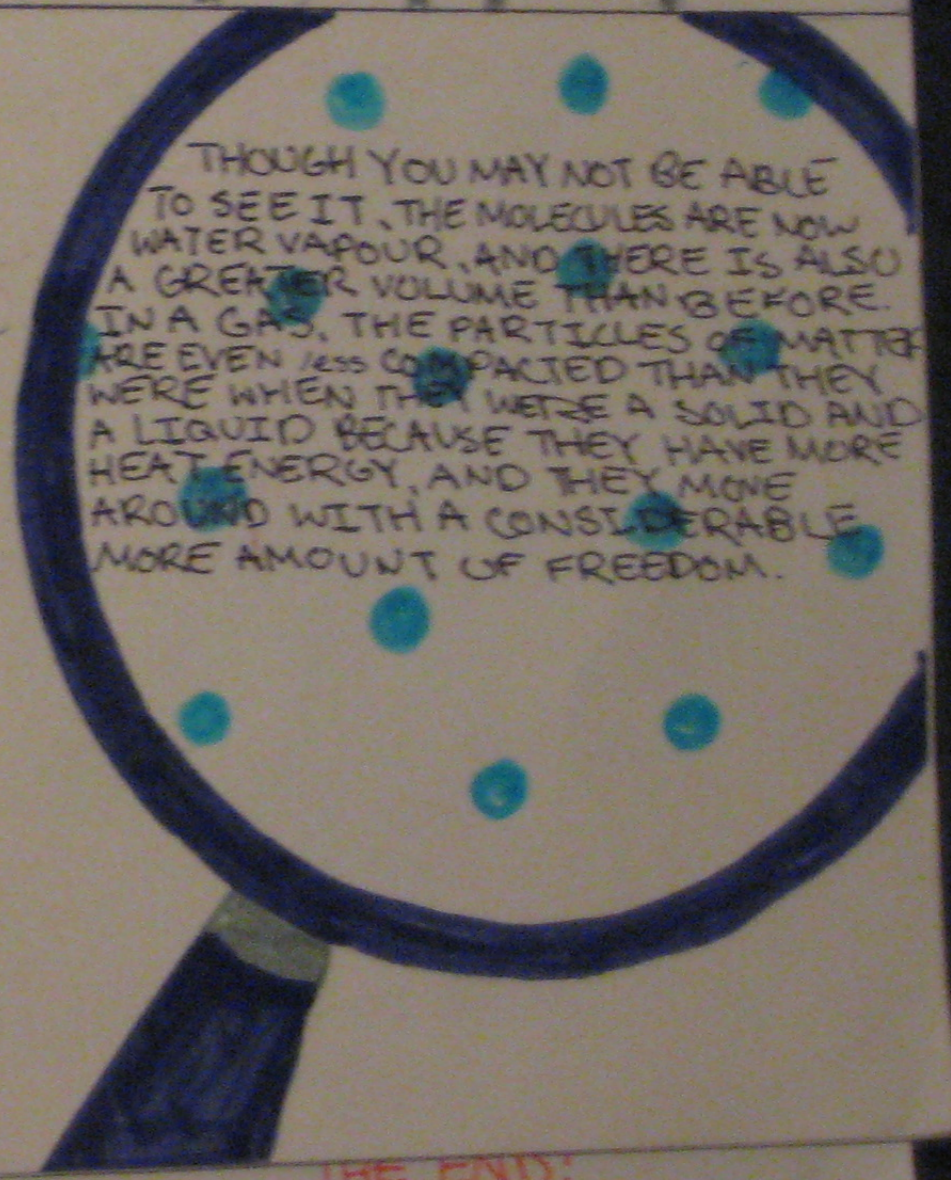


INSTEAD OF THE MALL ON BOXING DAY, YOU CAN LINE UP MORE, BUT AS MANY AS YOU CAN LINE UP MORE, YOU CAN STILL GET AROUND WITH MORE MOBILITY. PICTURE THE PARTICLES OF MATTER WHEN THERE ARE A FEW SHOPPERS, BUT NOT AS MANY AS YOU CAN MOVE AROUND WITH MORE MOBILITY.

AS THE SUN CONTINUES TO SHINE DOWN ON THE SNOWMAN THAT WAS ONCE A SOLID, THAT IS NOW A LIQUID THE MOLECULES BEGIN TO COLLECT MORE AND MORE HEAT ENERGY AND THE PARTICLES MOVED FASTER AND FASTER CAUSING THE PUDDLE TO EVAPORATE.



FINALLY, THE SNOWMAN THAT WAS ONCE A SOLID, WHICH WAS ONCE A PUDDLE, WHICH WAS ONCE A LIQUID HAS ENTERED THE FINAL STAGE OF MATTER AND IS A GAS

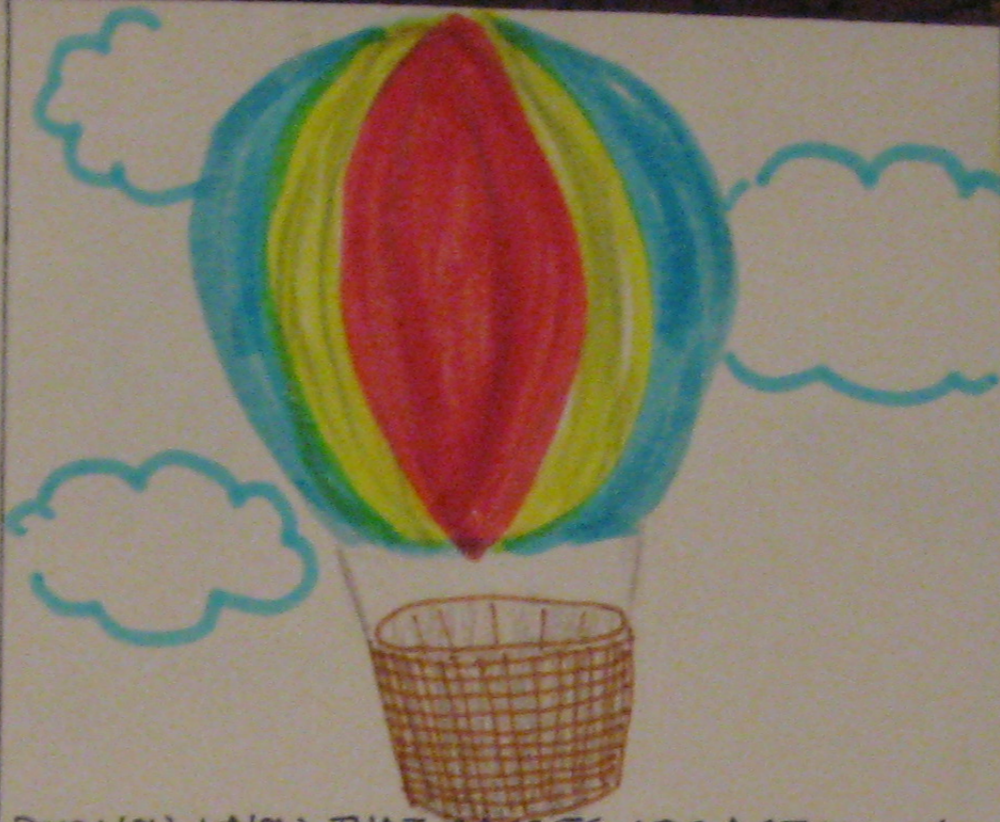


THOUGH YOU MAY NOT BE ABLE TO SEE IT, THE MOLECULES ARE NOW WATER VAPOUR, AND THERE IS ALSO A GREATER VOLUME THAN BEFORE. IN A GAS, THE PARTICLES OF MATTER ARE EVEN LESS COMPACTED THAN THEY WERE WHEN THEY WERE A SOLID AND A LIQUID BECAUSE THEY HAVE MORE HEAT ENERGY, AND THEY MOVE AROUND WITH A CONSIDERABLE MORE AMOUNT OF FREEDOM.

THE END!



TO VISUALIZE THIS, YOU CAN IMAGINE THE MALL EARLY IN THE MORNING DURING THE WEEK WHEN THERE ARE NOT MANY PEOPLE AT ALL, AND BASICALLY ONLY WORKERS, SECURITY GUARDS, AND A FEW SHOPPERS IN THE MALL. THE PEOPLE ARE ABLE TO MOVE AROUND FREELY AND THERE IS A GREAT DISTANCE BETWEEN EACH PERSON. JUST LIKE THE MOLECULES IN A GAS.

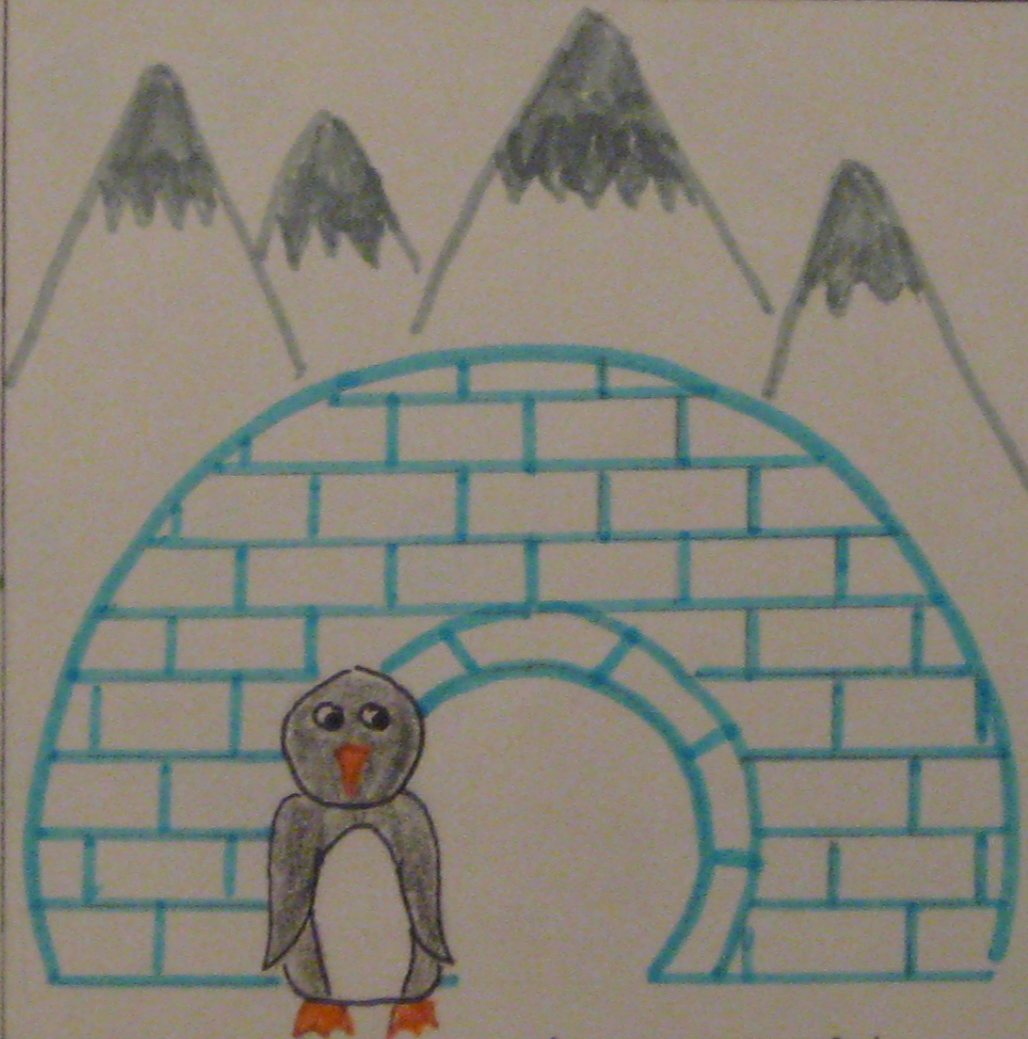


DID YOU KNOW THAT GASSES ARE ACTUALLY FLUIDS? A FLUID IS CLASSIFIED AS SUBSTANCES THAT CAN FLOAT OR FLOW, JUST LIKE LIQUIDS AND GASSES. WARM FLUIDS RISE AND COLD FLUIDS SINK. HOT FLUIDS RISE BECAUSE WHEN THE MOLECULES HEAT UP AND START TO MOVE FASTER AND BUMP INTO EACH OTHER AND EXPAND. THIS IS THE EXACT PROCESS A HOT AIR BALLOON USES TO FLY.



SO WHEN WATER VAPOUR RISES, IT GOES HIGH UP INTO THE SKY, AND WHEN THE TEMPERATURE OF THE MOLECULES BEGINS TO DROP, IT CONDENSATES AND VOLUME AND HEAT OF THE PARTICLES DECREASES. CONDENSATION HAPPENS ALL AROUND THE WORLD...

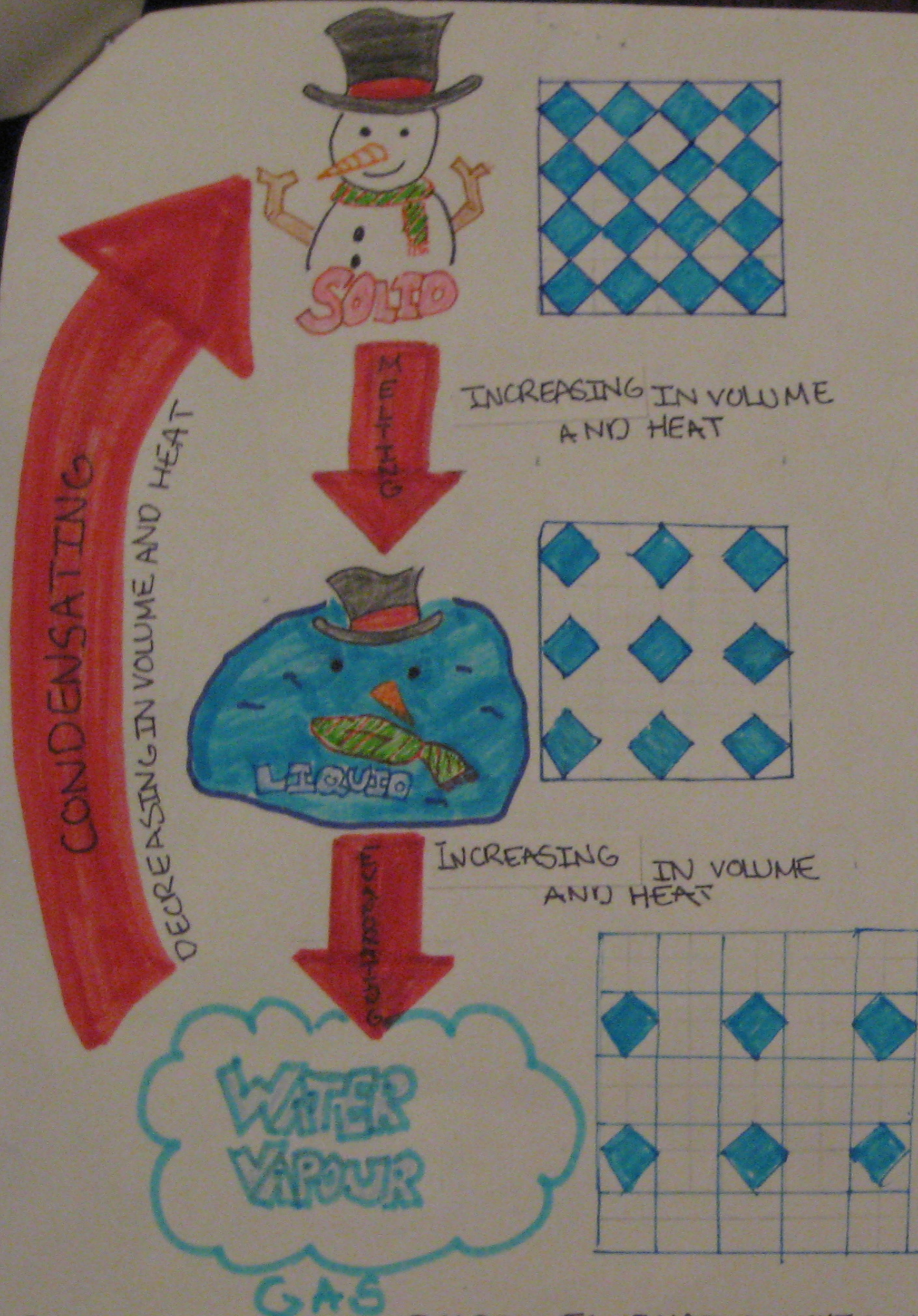
It might rain in the desert...



Snow or hail in the South Pole...



Or leave **DEW** on the grass in forests.



AND JUST LIKE THAT THE PARTICLES OF MATTER HAVE GONE BACK INTO THE DIFFERENT STATES OF MATTER



THE EVAPORATED PUDDLE MIGHT COME BACK TO EARTH AS RAIN, AND IF THE TEMPERATURE DROPS LOW ENOUGH, IT JUST MIGHT SNOW AND THE MOLECULES HAVE RETURNED TO THE FIRST STAGE OF MATTER, A SOLID, AND IF YOU HAPPEN TO DECIDE TO MAKE A SNOWMAN AGAIN, AND THE PROCESS WILL REPEAT ITSELF ONCE MORE....

THE END!