

# WHY FIND THINGS FLY



G. Grambo

# Why Things Fly

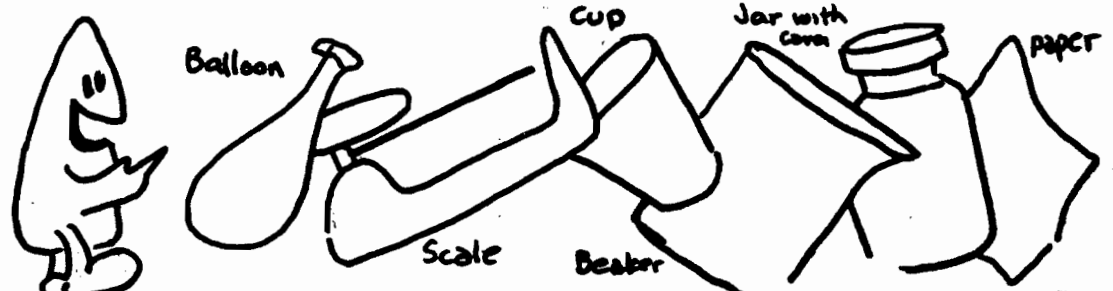
Name \_\_\_\_\_

Class \_\_\_\_\_ Box No \_\_\_\_\_

## What is air?

## Experiment 1

1) Begin With




Balloon, Scale, Beaker, Cup, Jar with cover, Paper

2) What will happen if I put a piece of paper in a jar, cover the jar, and put it in water?

Prediction

Try it.




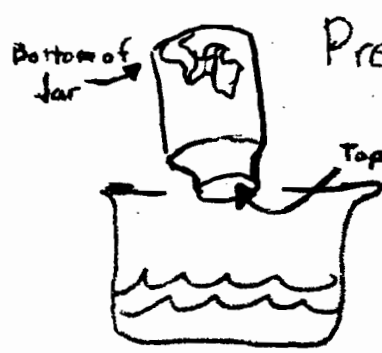
Q- How was the paper affected?

3) Predict what will happen to the paper if I do the same thing, but without the cover.

Prediction:

Try it

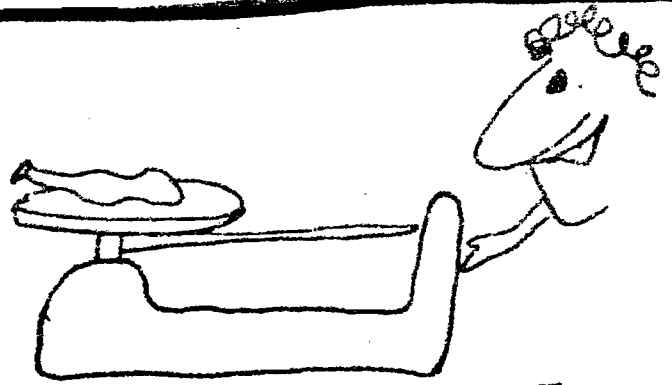
Explain Why this happened:



4

Next weigh a deflated balloon. How much do you think it weighs?

Prediction  g



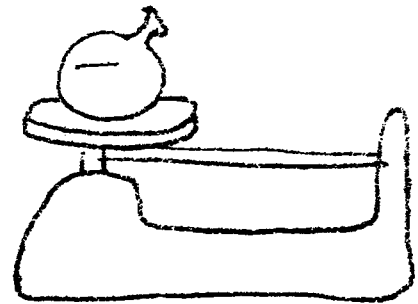
Actual Weight  g

5 Fill the balloon and weigh it again.

Q-Will it weigh more or less?

Q-Why?

Try it



Actual Weight  g

Q-How does Air look?

Q-How does Air smell and taste?

Q-Which weighs more a deflated or inflated balloon?

Q-Why?

Q-Why didn't the paper get wet in our experiment?

Q-From our experiment what are 5 things you can tell us about air?

# Why Things Fly

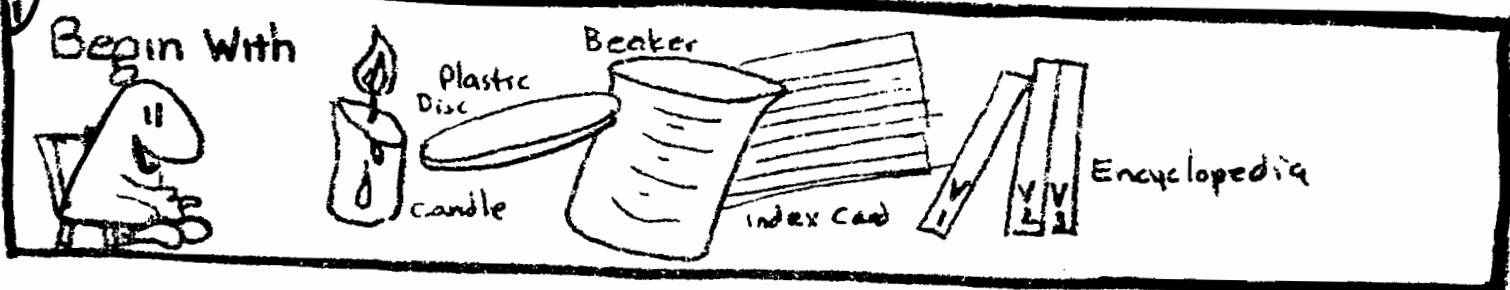
Name \_\_\_\_\_

Class \_\_\_\_\_ Box No \_\_\_\_\_

## What is air made of?

## Experiment 2

1) Begin With



The materials shown are: a lit candle, a plastic disc, a beaker, an index card, and an encyclopedia.

2) Place candle on plastic disk and light it.



Q-What might happen if I cover the candle with a beaker?

3) Q-Why will this happen?

4) Why do they give people oxygen in a hospital?



5) In a hospital. Why are there NO Smoking signs near the people in Oxygen tents?



6) Wet an index card and let it stand for 10 minutes

7) Describe what happened to the water.

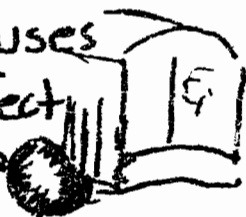
8) Q-Where did the water go?

9) Q-How has the water affected our atmosphere?

10) Q-Why do parents have to dust?

11) Q-How might dust get into our atmosphere?

12) Q-How do buses and cars affect our Air?



13) There are many parts to our air. Some are good, some are bad, but all are there

## Homework -

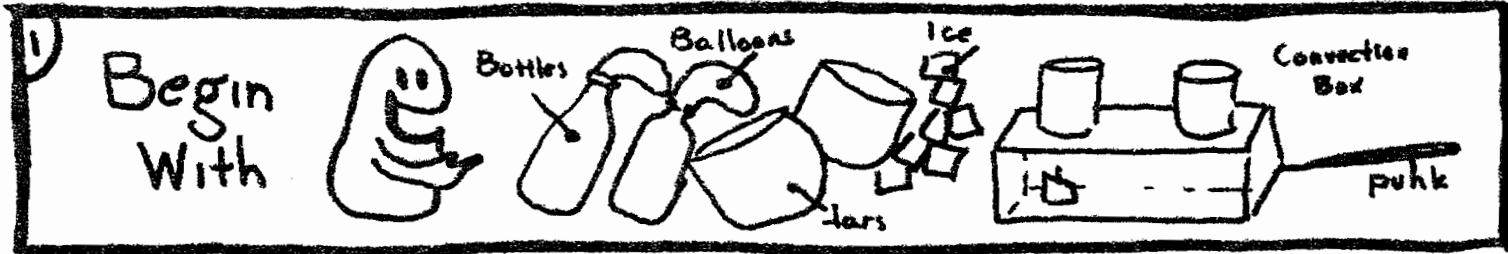
1) Name 3 things air is made of?

2) look in the encyclopedia. See if you can find out the other parts of air. See how much of each thing is in the air.

# Why Things Fly

Name \_\_\_\_\_  
Class \_\_\_\_\_ Box No \_\_\_\_\_

## Why does air move? Experiment 3



2) What happens to the molecules of something as I cool that thing and freeze it?

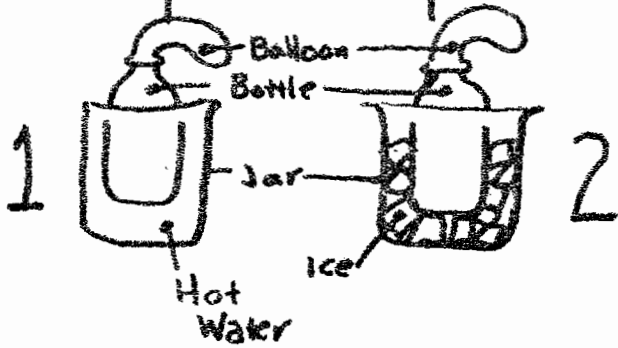
3) How are the molecules affected as I heat them to boiling?

5) Why does the same volume of something need more room when it's hot than when it's cold?

4) How many people could you fit in this room?  
  
How will this be affected if the people get energy and begin to move around?

6) As air or any other substance gets hot it picks up extra energy

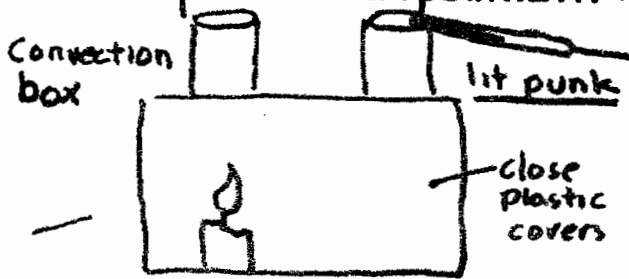
7) Set up this experiment



8) Why does balloon #1 inflate or get bigger?

9) What things are needed in order for something to burn?

10) Set up this experiment.



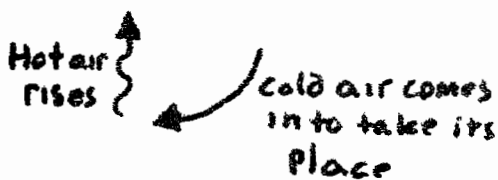
light candle and watch what happens.

11) What happens to the smoke from the punk?

12) Where does the smoke and heat go when the candle burns?

13) Since it goes there, where does the air come from to keep the candle burning?

14) Air moves due to Convection



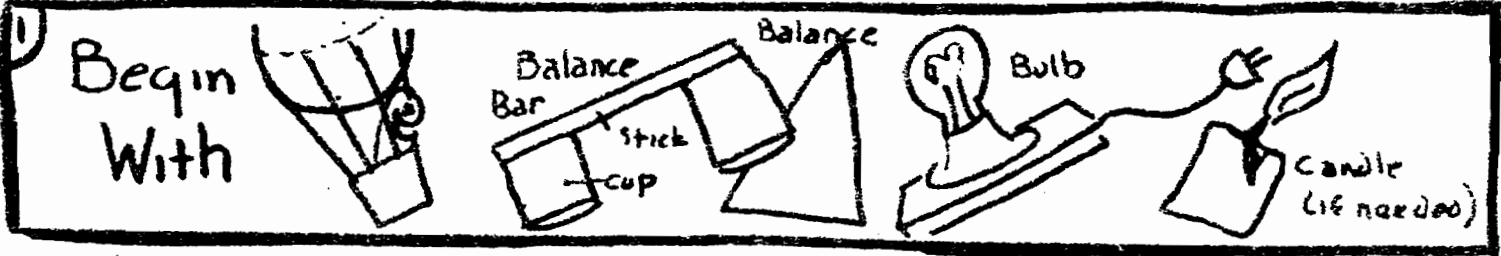
Homework -

1- Why does hot air rise?

2- Why would a jar of hot air weigh less than a jar of cold air?

Why Things Fly Name \_\_\_\_\_  
Class \_\_\_\_\_ Box No \_\_\_\_\_

How does moving air affect things? Experiment 4



2) How does heat and cold affect air molecules?

3) Why does a jar of hot air weigh less than a jar of cold air?

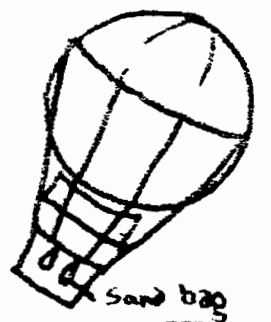
The diagram shows a balance scale with a triangular base. On the left pan is a jar labeled 'Cold'. On the right pan is a jar labeled 'Hot'. The 'Hot' jar is higher, indicating it is lighter. There are question marks around the jars.

4) If you were in a burning building why is it better to stay near the floor than to stand up?

The diagram shows two figures. On the left, a figure is crouching low to the ground. On the right, a figure is standing upright. Both are surrounded by flames, representing a fire.

5) You want to fly in a balloon. Would you fill it with hot air or cold air?

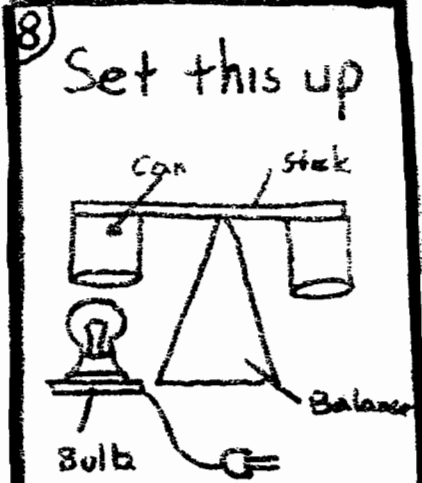
Why would you use this kind of air?






6) Look at the light bulb  
Turn it on.  
How would you know  
it were on, if you  
were blind?

7) How does the  
bulb affect  
the air above  
it?



9) Turn on the bulb  
Watch what happens

10) Why does the balance  
tip?   
(If the bulb  
does not work  
use the candle)

11) How does hot air  
affect things?

12) Explain how Convection  
works.

Homework - (look in an encyclopedia or book)

1- Why did people use balloons and blimps?

2- How did they fly?

3- How do you think they (pick one) are  
controlled?

# Why Things Fly

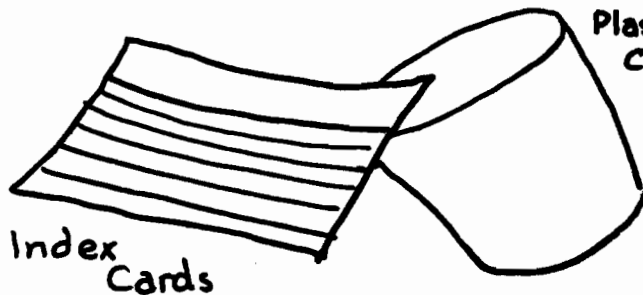
Name \_\_\_\_\_

Class \_\_\_\_\_ Box No \_\_\_\_\_

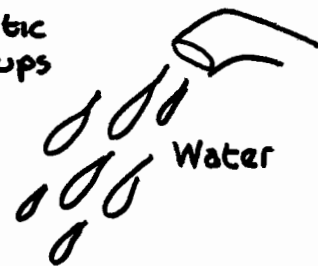
## Does air exert pressure? Experiment 5

1

Begin With



Plastic Cup



Q- What are 5 things you can tell me about air?

Q- How do we know air has weight?

Q- Prove air takes up space.

2

How would your hand feel if I began to pile books on it?



Why does your hand begin to feel this way?

3

How would a scale be affected if I begin to pile books on it?

How might the scale be affected if I replace the books with blocks of air?

4) Which would weigh more?

put an X in the box

Prediction

Why?

Q- Why do these things have weight?

5) Put some water in a cup. Cover it with a index card. Turn over cup, holding card. Remove hand from cup.

(Fill cup to the top)

6) Why doesn't water fall out?

What holds the card on the glass?

As I climb a mountain the air gets thinner.

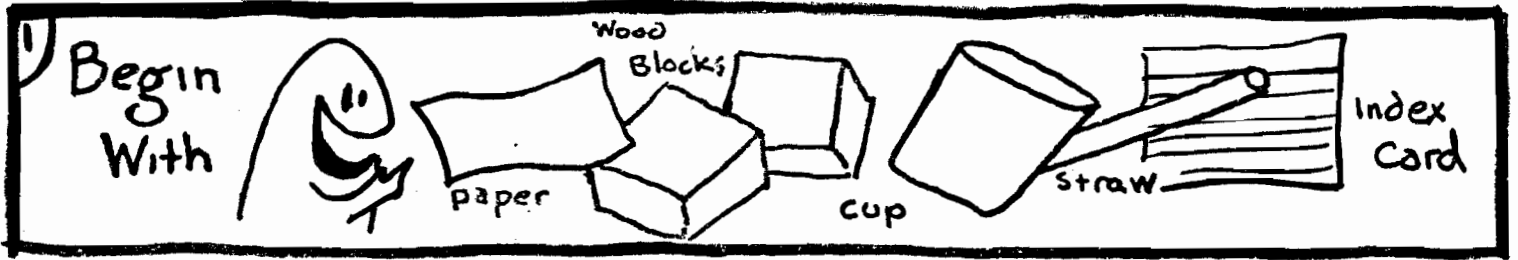
Q- How does this affect the pressure of the air?

Q- How does air pressure affect things like the can I heated or our glass of water & card?

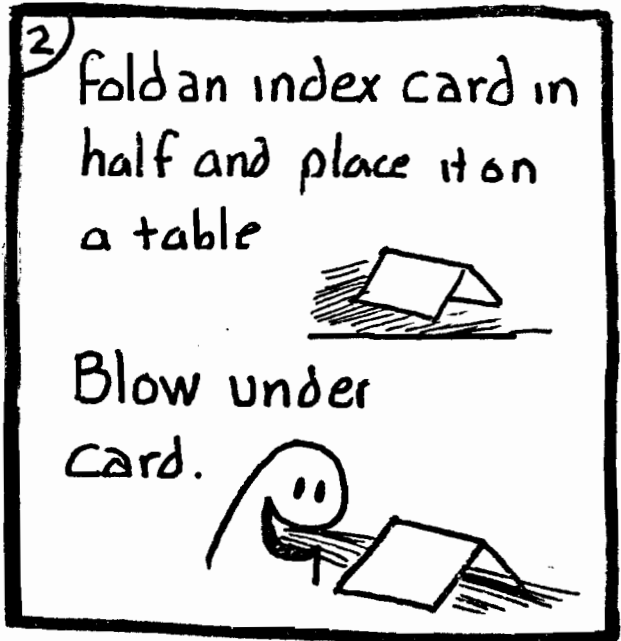
Stop  
It's time  
Quiz

## What is Lift?

## Experiment 6

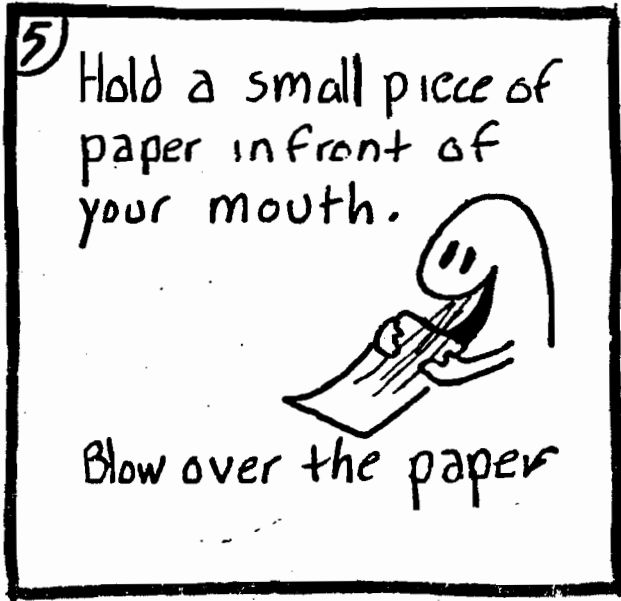


A man had an idea. He said that that pressure exerted by a fluid (air is a fluid) changes with its speed. He called his idea Bernoulli's principle. His principle explains why moving air exerts less pressure than air that is not moving. The faster air moves the less pressure it exerts



3) Describe what happens to the card.

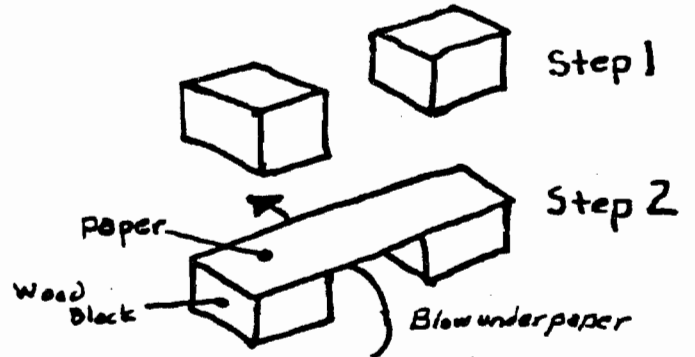
4) Why does this happen? (explain in terms of Bernoulli's principle)



6) Why did the paper lift up?



7) Setup this experiment.



8) Try it. What happened?

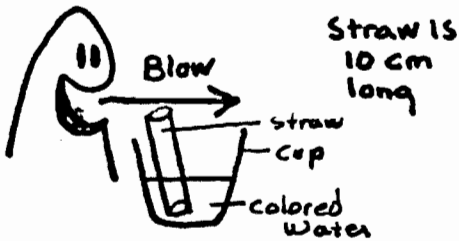
Why did this happen?

If you blow under the paper will the paper fall off the wood?

Why or Why not?

Let's try Bernoulli's principle one more time

9) Set up this experiment



10) Explain what happened in terms of Bernoulli's principle

Remember the object will move in the direction of the least pressure, because the pressure on the other side pushes it.

Homework -

1. How does Bernoulli's principle work?

11) How did the moving air affect the liquid in the straw?

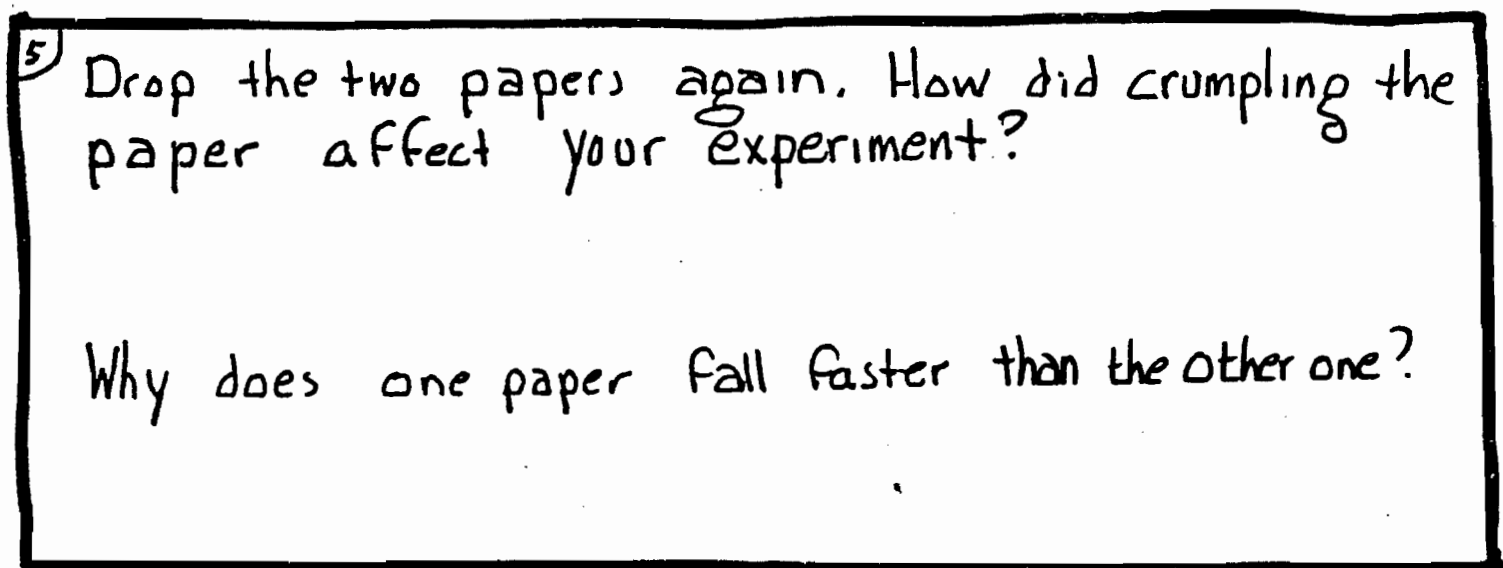
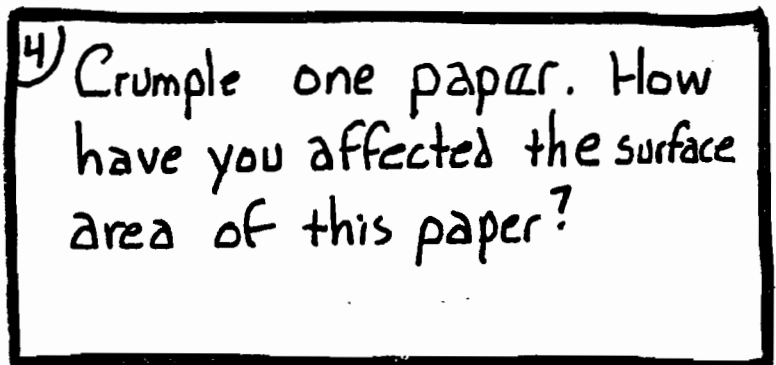
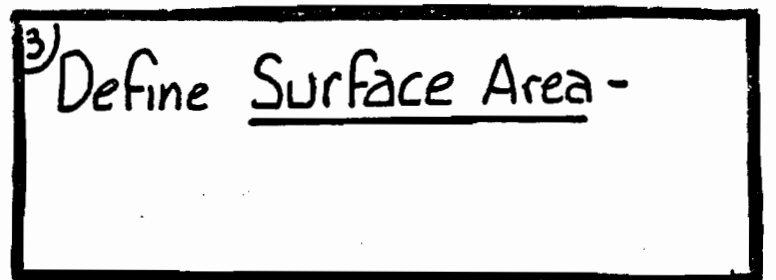
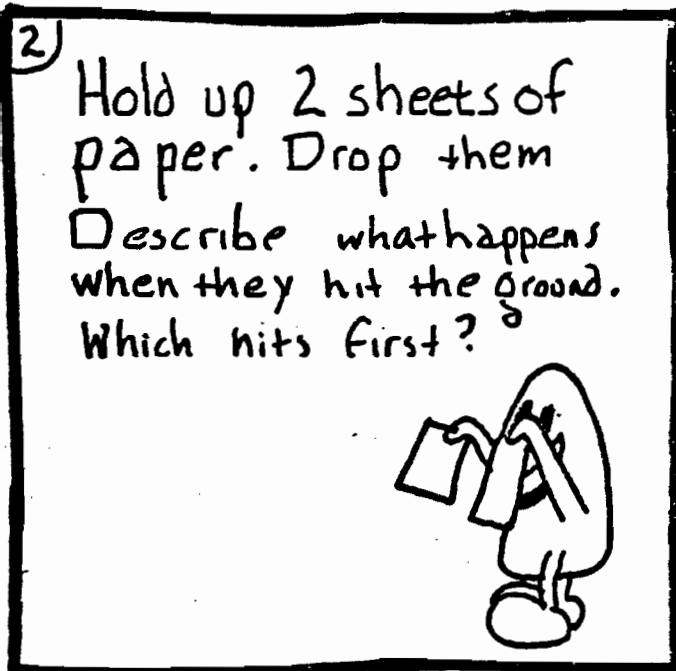
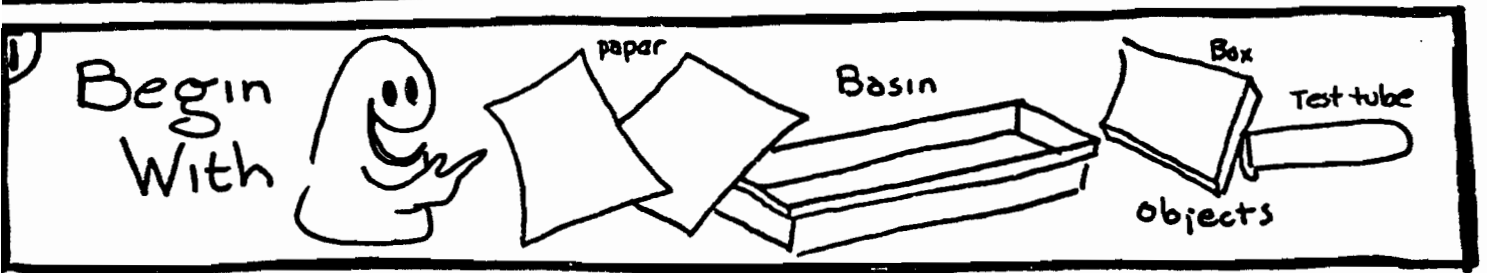
# Why Things Fly

Name \_\_\_\_\_

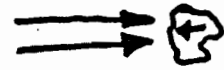
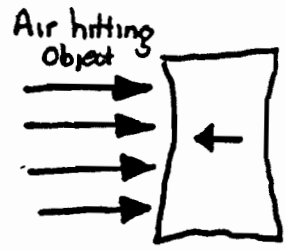
Class \_\_\_\_\_ Box No \_\_\_\_\_

## What is drag?

## Experiment 7



6) Lets say air is moving to the right. If I put an object, like a kite, in the air, the air must go around it, since it can't go through it. The kite blocks the air flow. If I move the kite to the left air will be hitting it. It slows the kite down. This is resistance. The smaller an object is, the less air hits it, and therefore it will have less resistance.



7) There are two objects in a basin of water. Push them through the water.

8) Why does one object move faster? (They both weigh the same)

9) Resistance is drag. How might drag affect the shape a kite should have?

## Homework -

1- What is drag? What causes drag?

2- How might drag affect a kite?


# Why Things Fly

Name \_\_\_\_\_  
Class \_\_\_\_\_ Box No \_\_\_\_\_


How can we build something that has less drag?

## Experiment 8


1) Begin With



paper

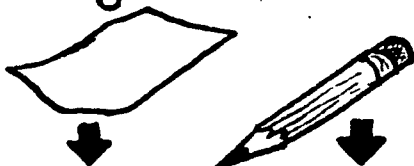


pencil



Tape

2) Hold a paper and a pencil at the same height. Drop them.



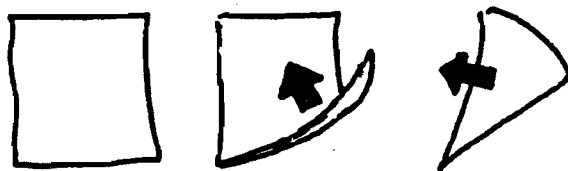
3) They should hit the ground at the same time.  
Why does one hit the ground before the other?

4) What does drag have to do with this experiment?

5) Take 2 papers. Crumple one of them. Hold both at the same height and drop them. How has crumpling the paper affected drag?

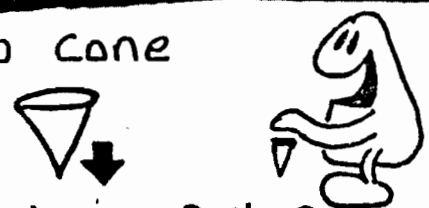


6) Take another piece of paper and roll it into a cone. Tape cone






7) Drop cone

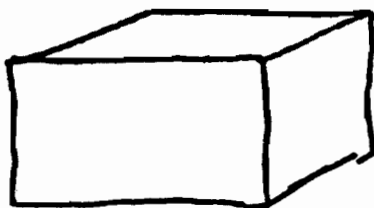


Why does it fall faster than the paperball?

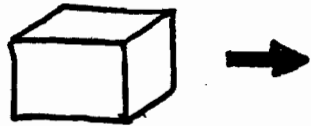
8) Why does the cone have less drag than a falling sheet of paper?




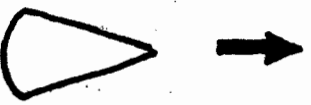
9) How can we make this object move through the air faster? (Draw the new shape)




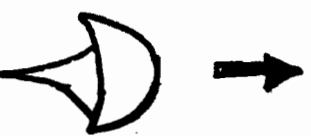
10) Which object will move faster?

A 

B 

C 

D 

E 

11) Why will this one move faster?

Homework —

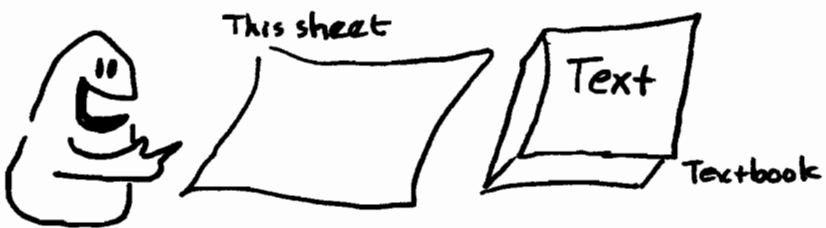
- 1- How does the shape of an object affect drag?
- 2- How can we decrease drag on an object?

# Why Things Fly

Name \_\_\_\_\_  
Class \_\_\_\_\_ Box No \_\_\_\_\_

## Why does a kite fly?


## Experiment 9

1) Begin With 


2) What does Bernoulli's principle tell us?

3) Name three things that fly.

4) How might the wings of a bird help a bird fly?

5) If we cut a bird's wing we would see it has a special shape. 

6) Would it take longer to walk over the top or bottom of the bird's wing?  
Why?



7) Air starts at x and moves to y. If the air on top and bottom get to y at the same time which moves faster?

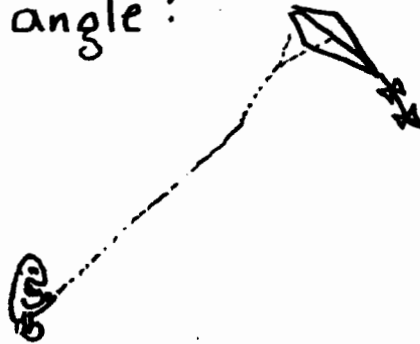
8) According to Bernoulli why would the wing lift up?

9) Here is a picture of a flying kite. How is the kite like a wing? (show movement of air over and under kite)



10) What gives the kite its lift? (you may need your textbook)

11) Why must a kite fly on an angle?



12) What are the three main types of kites? How does each fly?

Homework - Read chapter 1 of your kite textbook

1- Why does a kite fly?

2- What are the main parts of a kite?

Bring your text tomorrow

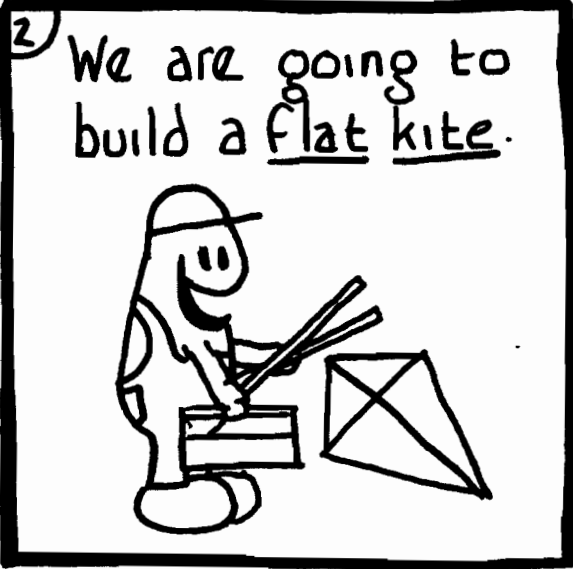
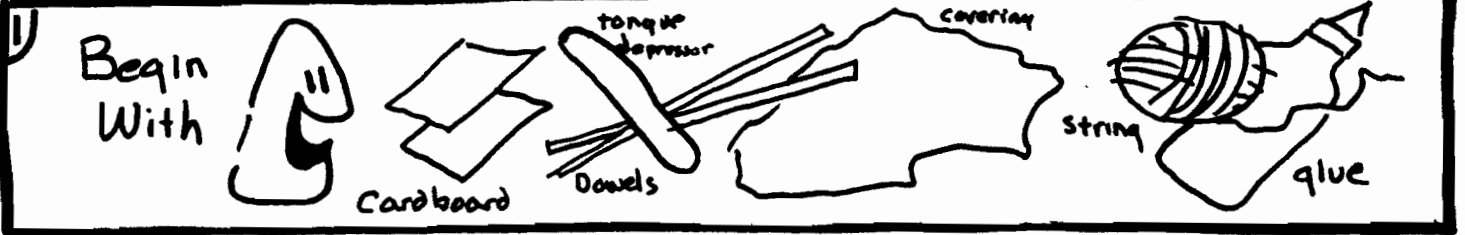
# Why Things Fly

Name \_\_\_\_\_

Class \_\_\_\_\_ Box No \_\_\_\_\_

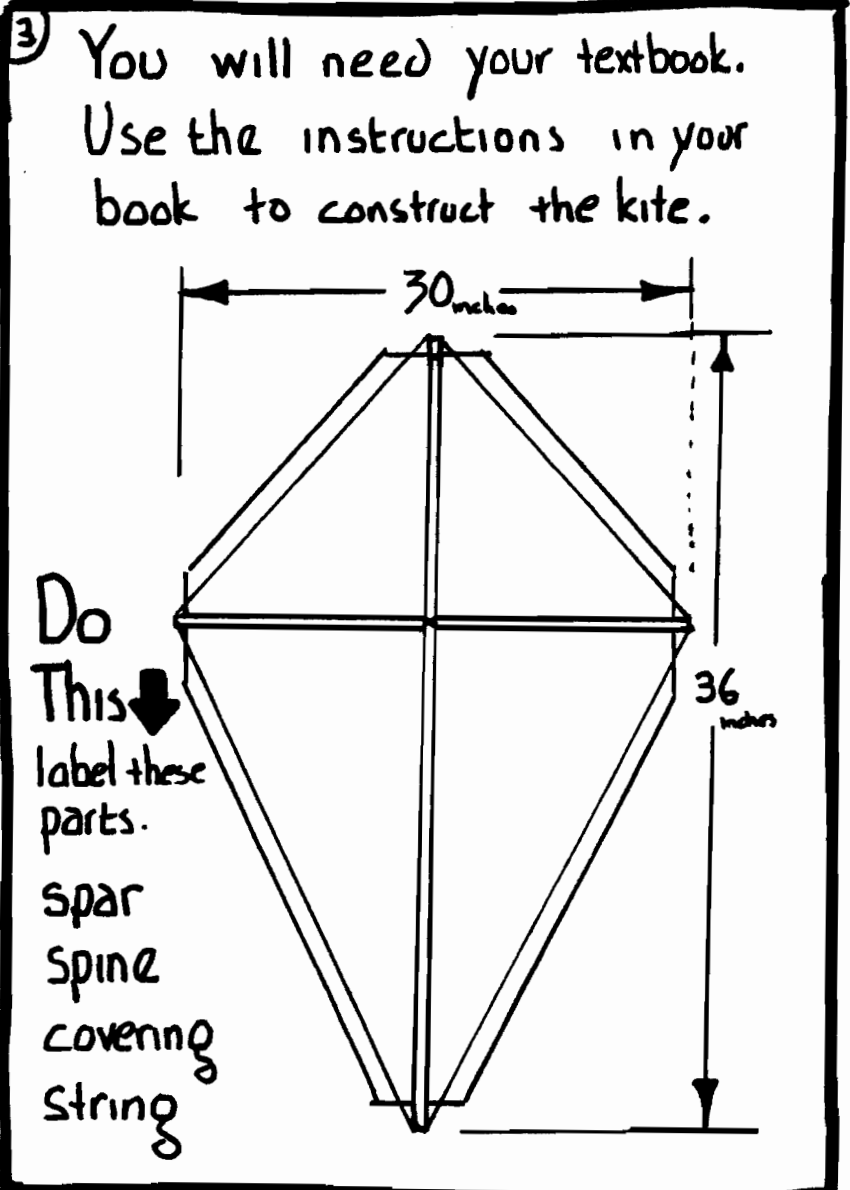
## How can we build and fly a kite?

## Experiment 10

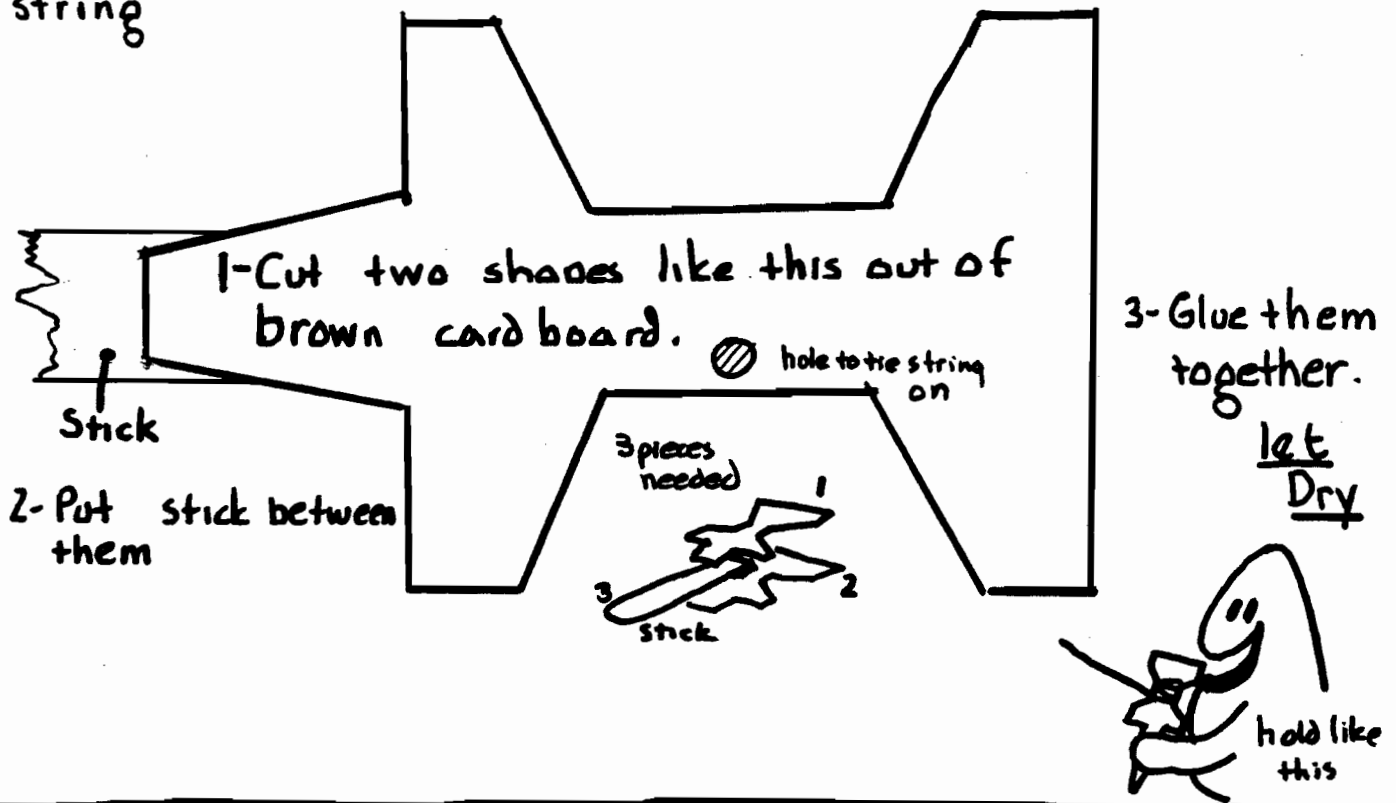


4) Why does this kite need a spar and spine?

5) Why is the covering cut bigger than the kite?



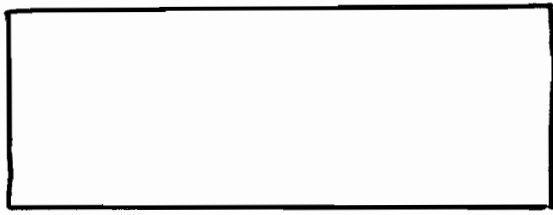
6) String will be attached to your kite so you can control it. You will need a reel to hold your kite string



After attaching a bridle and line you are ready to FLY.

Stand with your back to the wind. Raise the kite up along side you, holding it by the bridle. When you feel a tug on the kite, caused by the wind, let go of the kite. The kite is now up. Reel out line. Tugs on the kite line raises the kite up. Keep the top of the kite up so it catches the wind. When its time to go reel the line in slowly. Walk towards the kite. Keep reeling until the kite falls to the ground. Pick it up; don't drag it. Get a set of rules for flying. from your teacher. Have fun.

# Why Things Fly



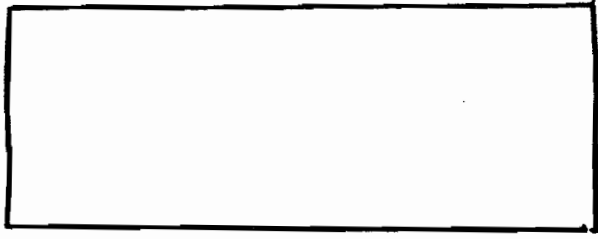
Name \_\_\_\_\_

Class \_\_\_\_\_ Box No \_\_\_\_\_

## Quiz-Experiments 1-5

- 1- What are 5 things you can tell me about air?
- 2- What are 3 things air is made of?
- 3- How do we know air contains oxygen?
- 4- Why does hot air rise?
- 5- What does convection mean?
- 6- Prove air has pressure?
- 7- Prove air takes up space?

# Why Things Fly



Name \_\_\_\_\_

Class \_\_\_\_\_ Box No. \_\_\_\_\_

## Quiz - Experiments 6-10

1- What is lift?

2- What causes lift?

3- What does Bernoulli's principle tell us?

4- What is drag?

5- How can we decrease drag?

6- What causes drag?

7- Why does a kite fly?

8- What is the spar and spine?