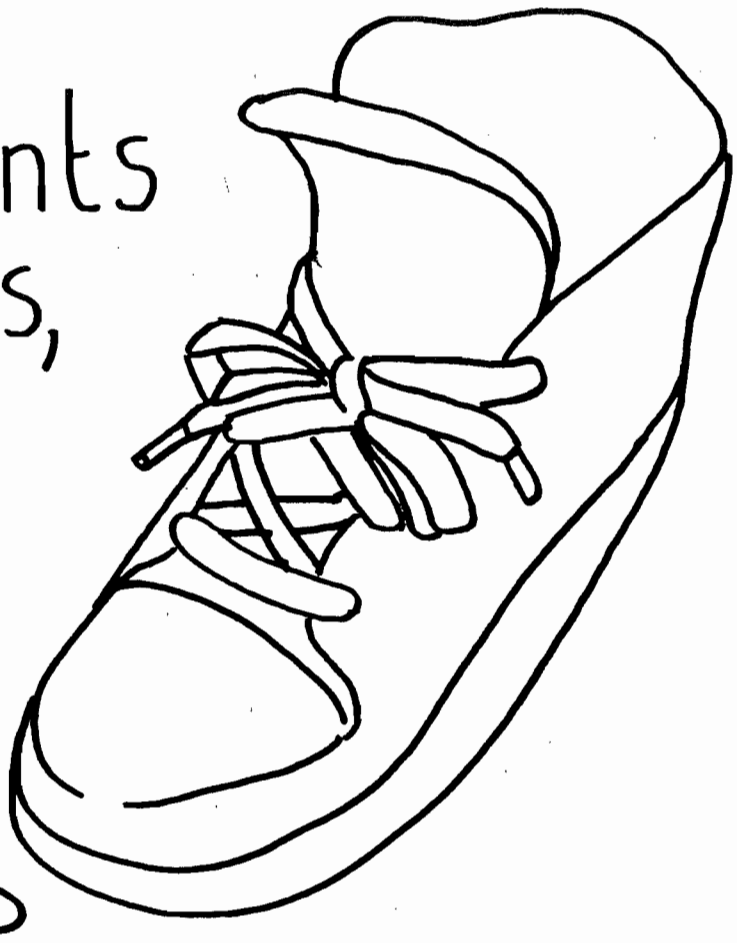
snakes

turini
grambo
1999

EECE 555: TEACHING MATHEMATICS AND SCIENCE IN THE ELEMENTARY SCHOOL

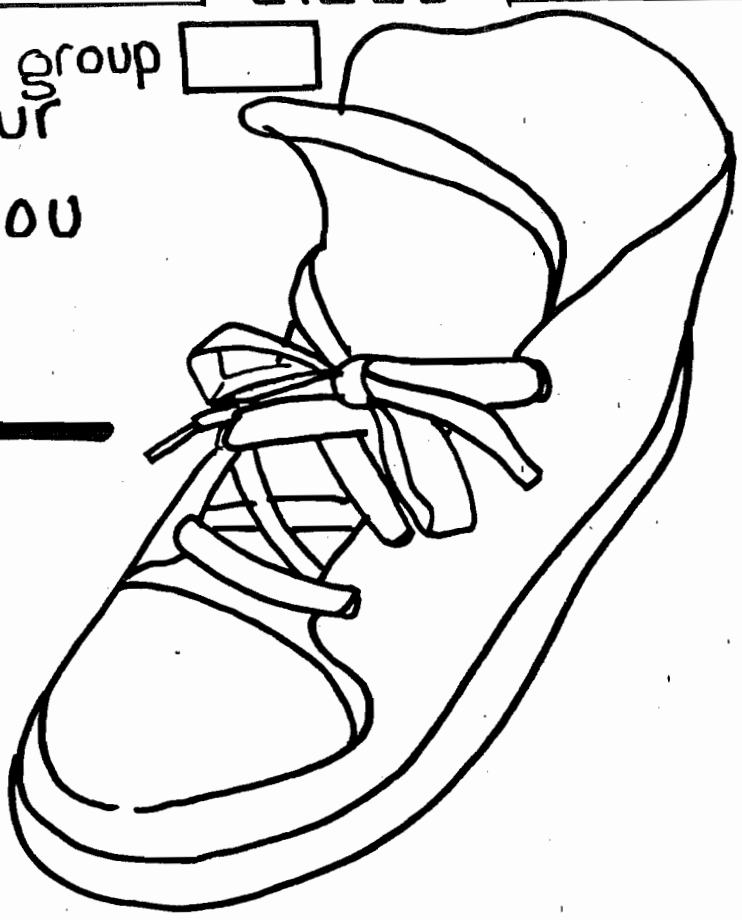
Dear Students and parents,



We will be working on a unit involving your sneakers. You will be taking off your sneakers in order to do this work.

name _____ class _____ group _____

How well do your sneakers keep you from slipping?

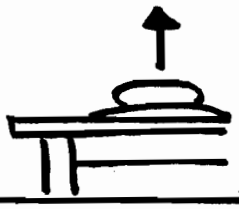


parent's signature _____

1) Examine the "Suction Cup"

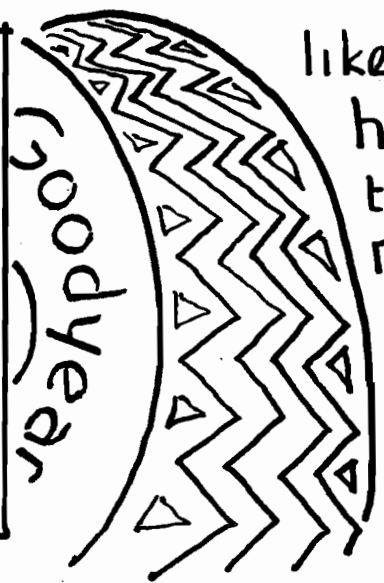
Describe it

2) Press the cup onto the table top.
Try to pull it up.
Why is it difficult to remove?



3) Describe the bottom (sole) of the sneaker

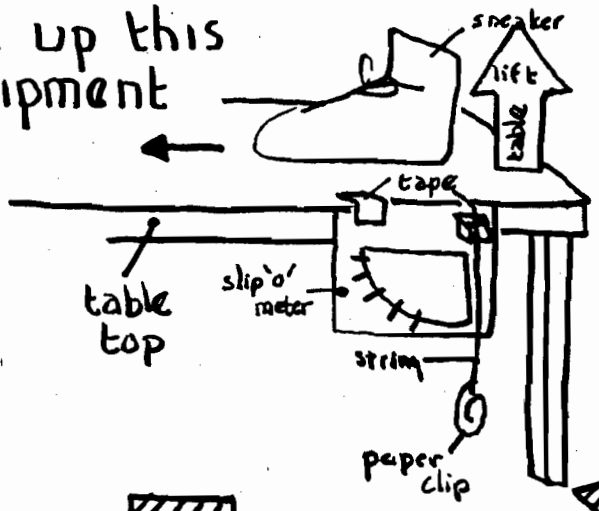
4) Why does the sneaker have treads and "suction cups"?



like a car tire sneakers have been developed to hold you to the road

Let's see if they slide

5 Set up this equipment



7 Which sneaker has more "holding on" power?

WHY?

Now Let's slide

Lift the table up to the angle indicated ① below and record your results

	10°	20°	30°	40°	50°
1					
2					
3					
4					
5					
6					

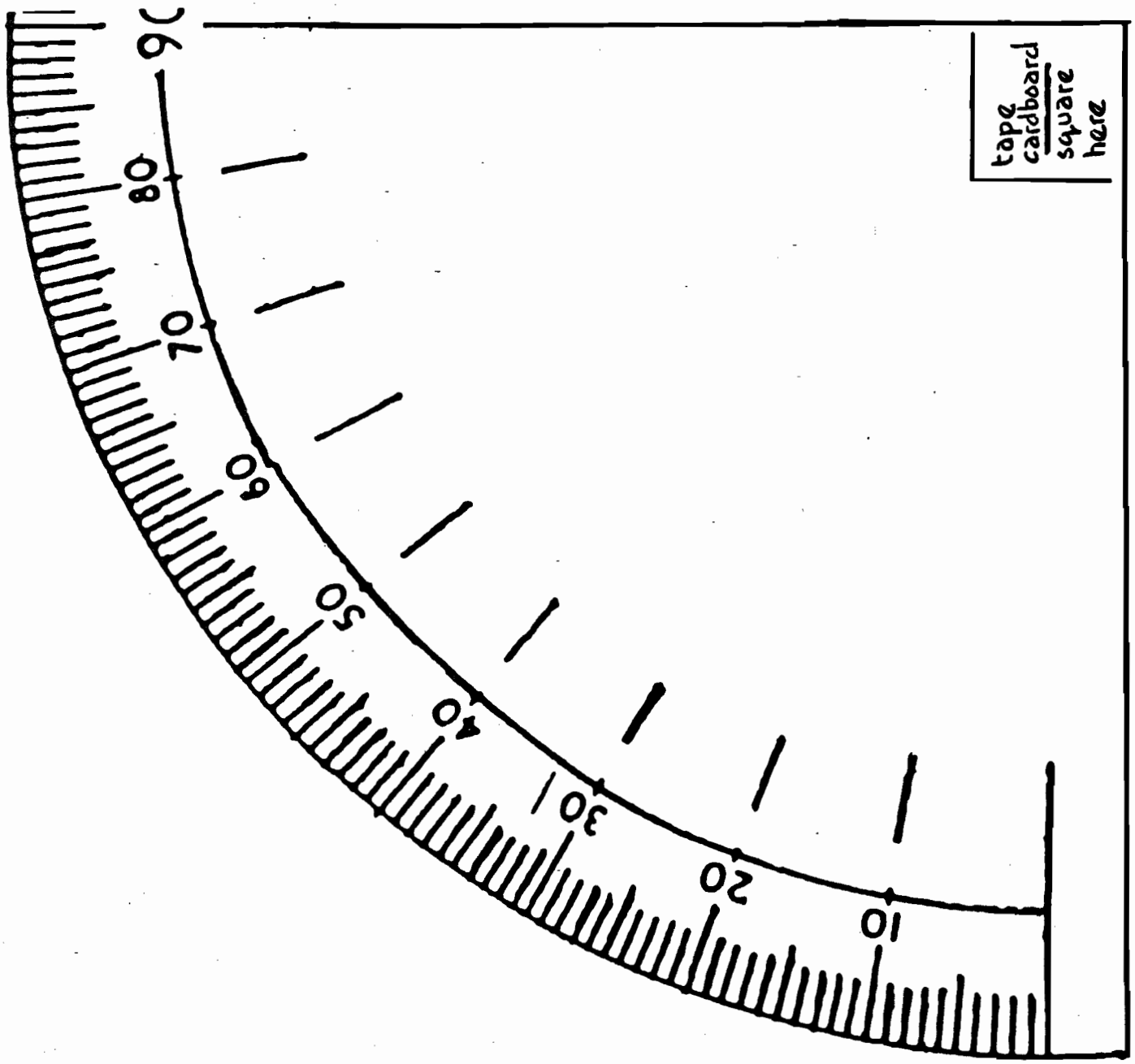
6 Tell about your sneakers

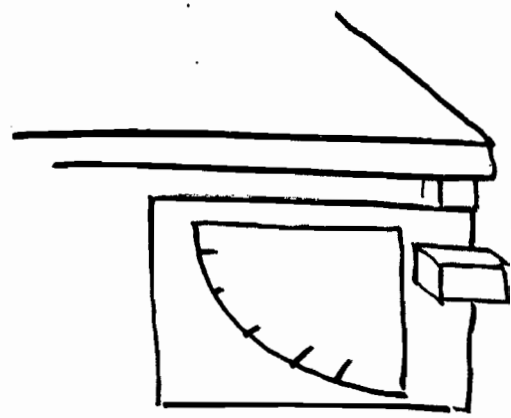
	name	brand	pattern
1			
2			
3			
4			
5			
6			

draw or describe the patterns you observe

Homework-

Why does one kind of sneaker keep you from sliding better than other sneakers?


tape cardboard square here
90
80
70
60
50
40
30
20
10



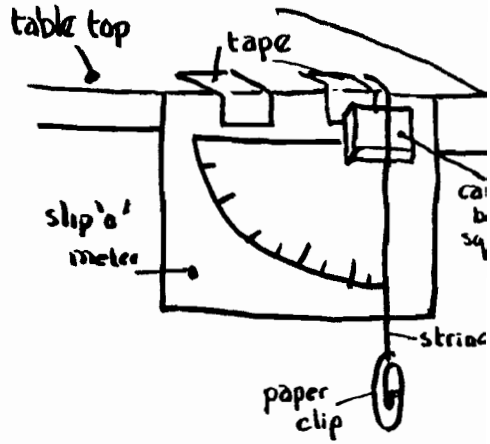


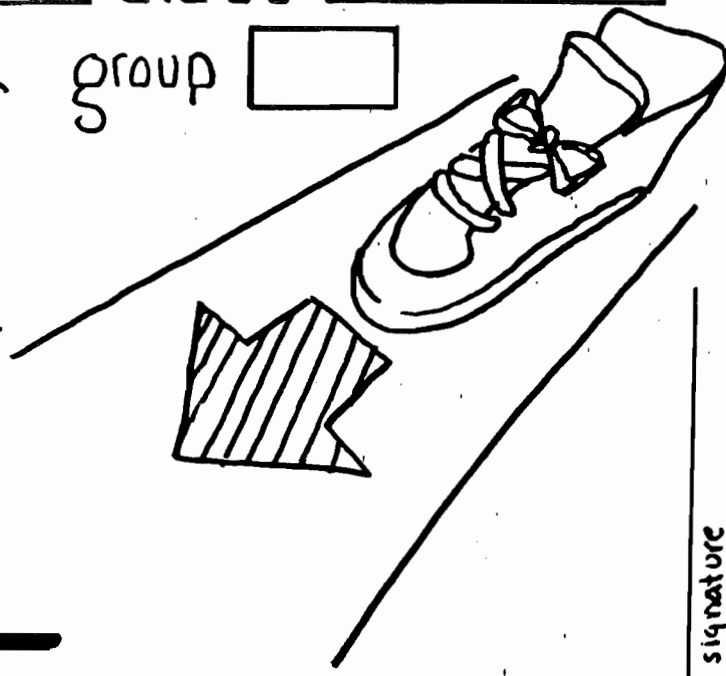
table top
tape
slip 'o' meter
paper clip

slip 'o' meter

name _____ class _____

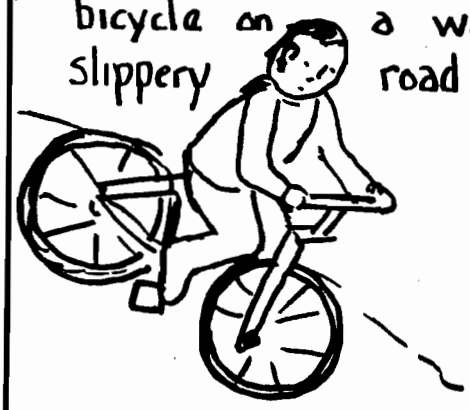
group _____

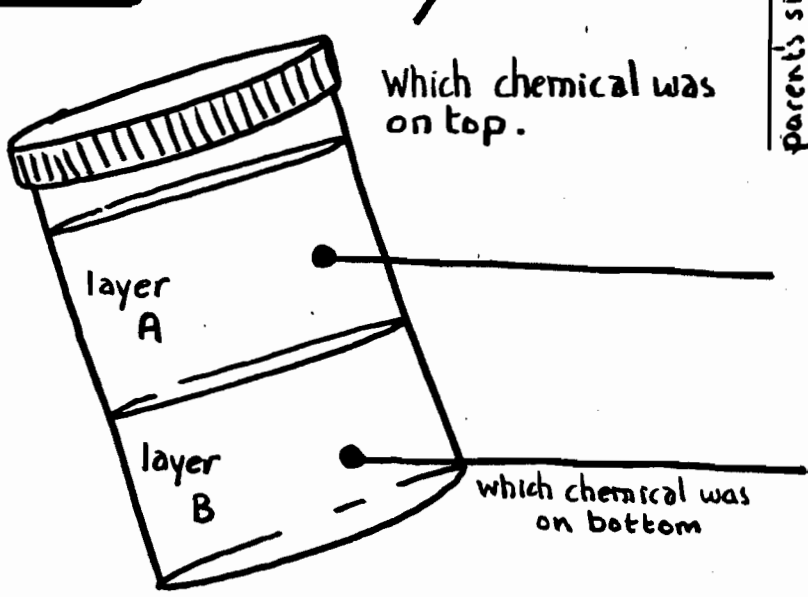
Will you slip if you change the surface you walk on?



parent's signature

1) How do you stop a bicycle on a wet slippery road?





the liquids do not mix because of their difference in density

2) Sometimes oil, spilled from cars, sits on the road and is effected by the rain.

mix 5 ml. of oil with 5 ml. of H_2O (water)

describe what happened

define

Density –

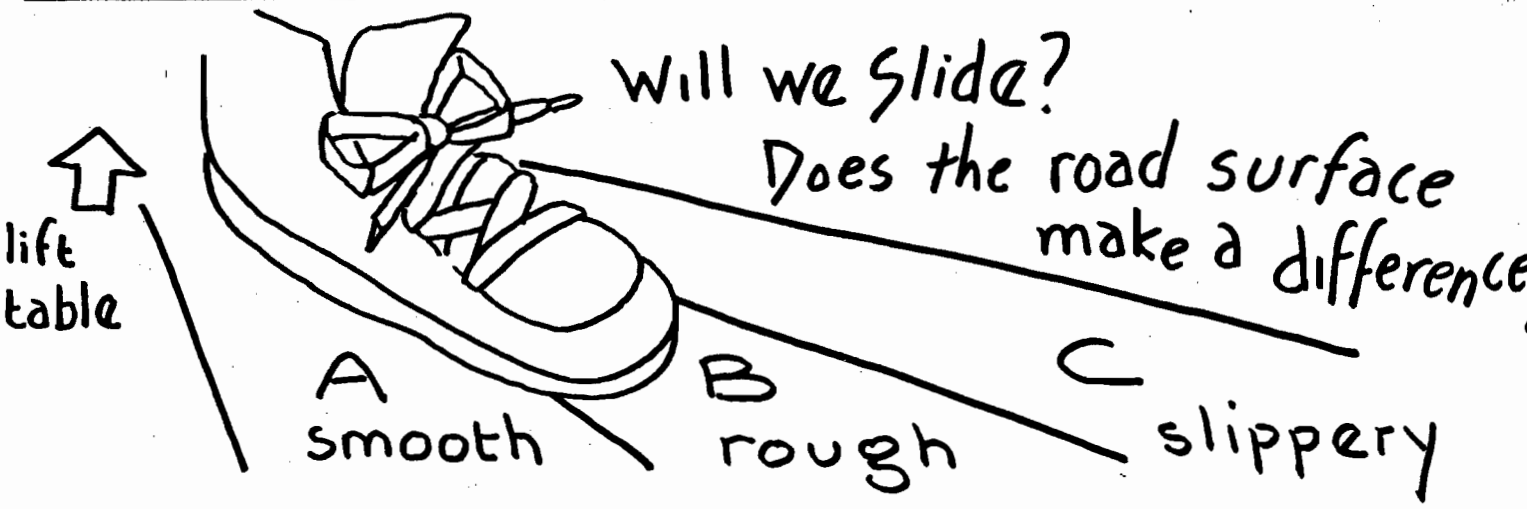
3) Rub your hands together

How do they feel?

4) define Friction

5) What role does friction play in stopping a bicycle or you when you run?

what if oil is on the road?



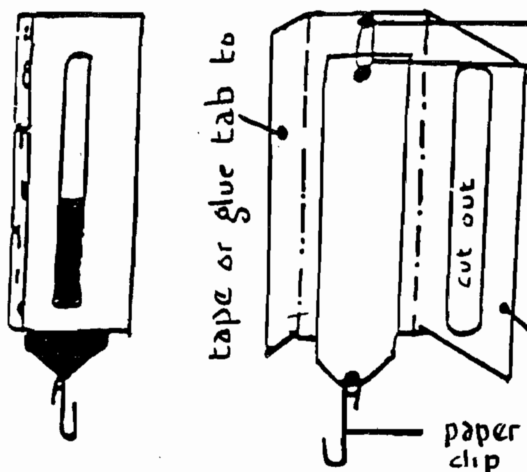
	brand	pattern	angle A	angle B	angle C	angle A	angle B	angle C
1								
2								
3								

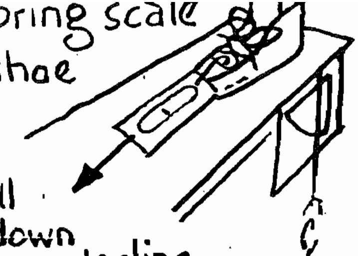
Use graph paper to show how all of the sneakers compare to each other.

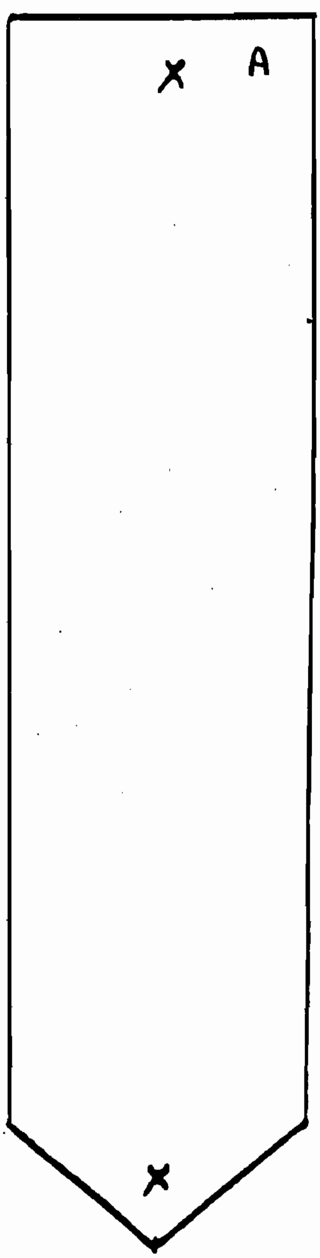
Homework-

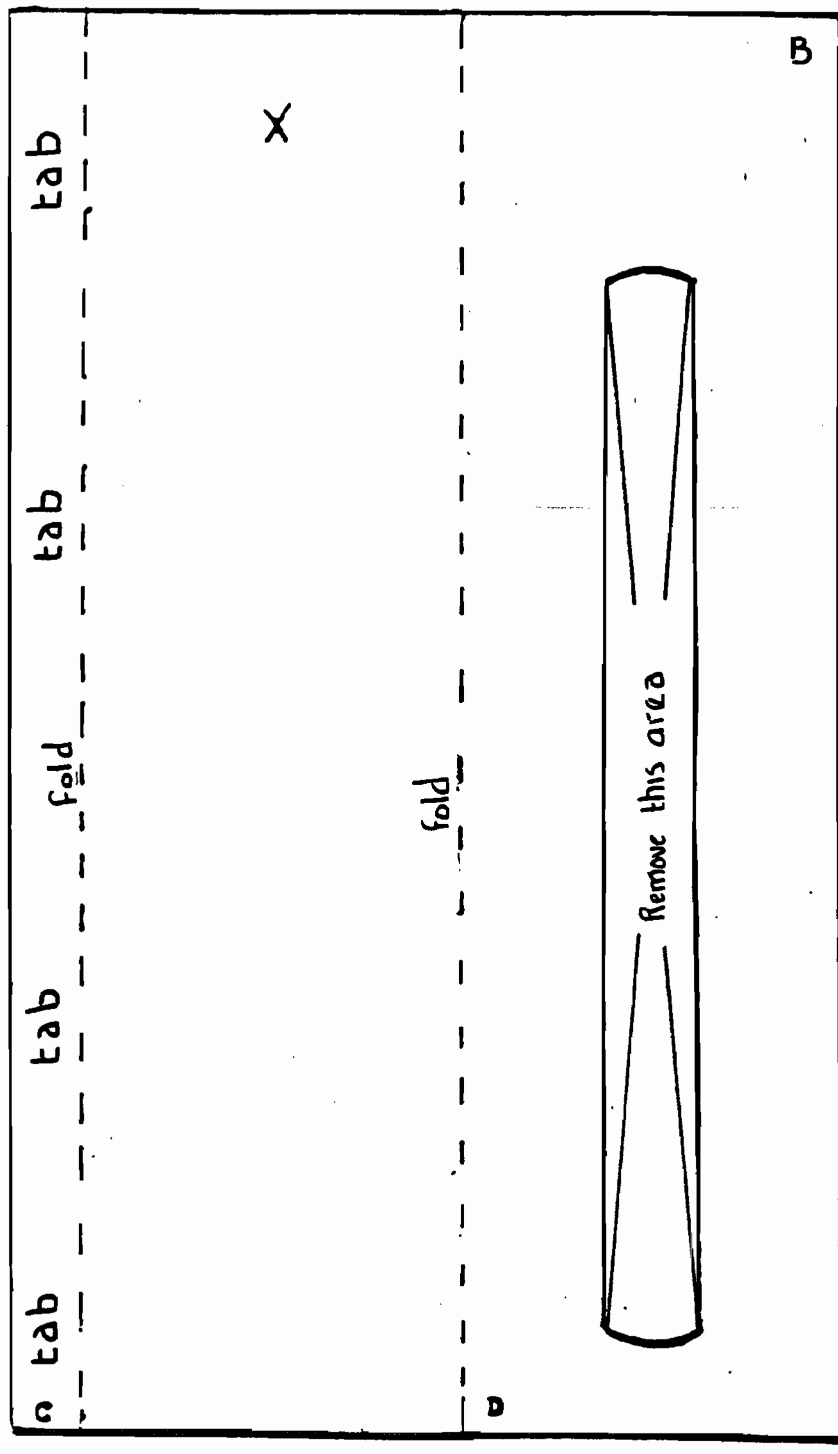
Which surface kept the sneaker from sliding? (Why?)

spring scale







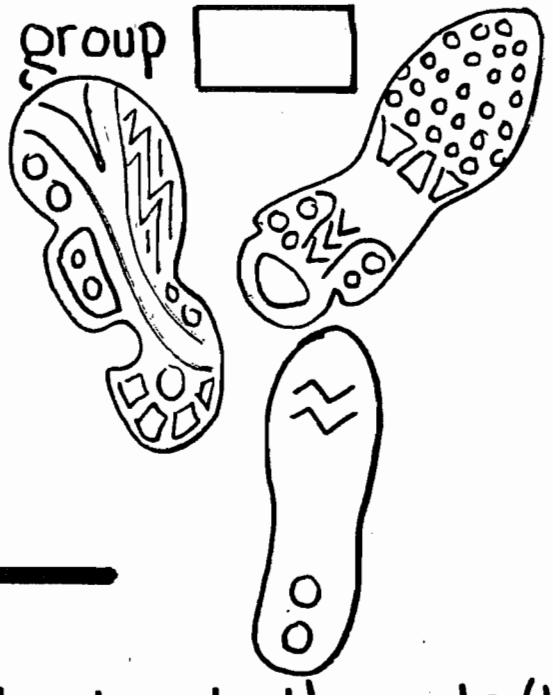


1999

name _____ class _____

group _____

How much of your shoe touches the floor?

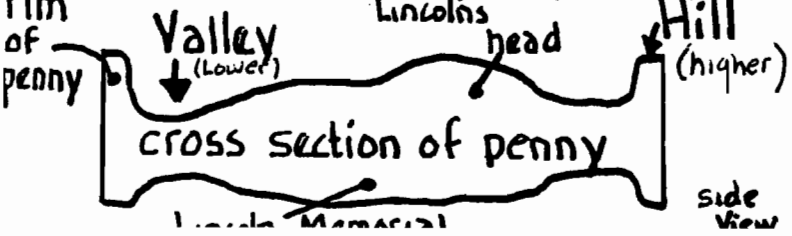


parent's signature

1) Place a penny under this sheet of paper and rub over the sheet with a pencil.

Describe what happens

2) Why didn't all of Lincoln's face show up?



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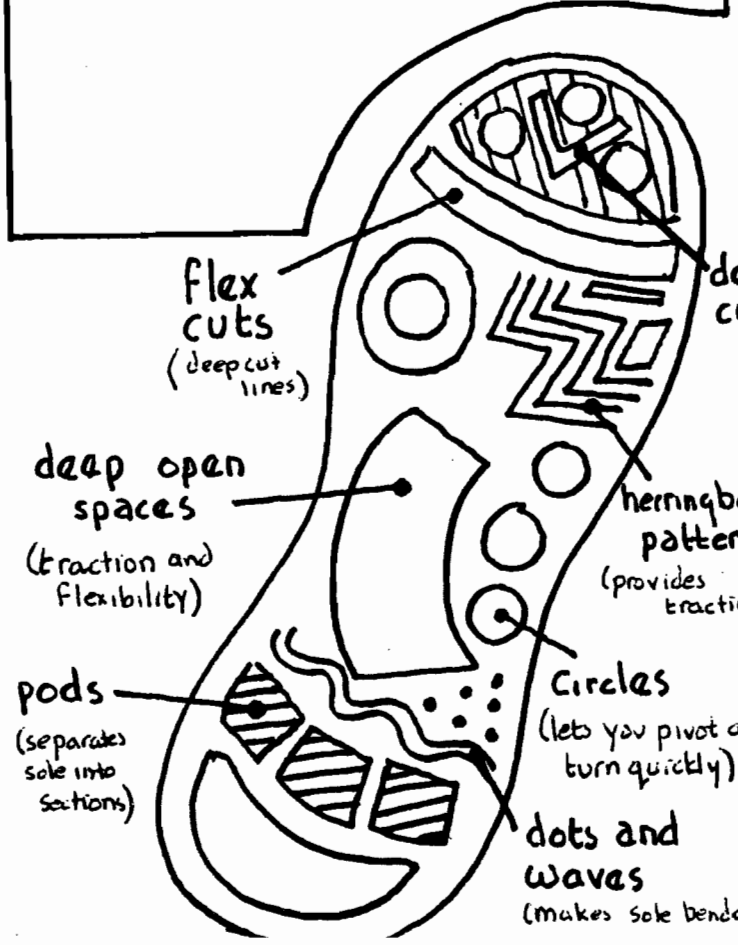
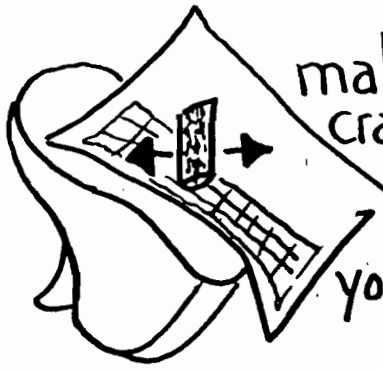
Look at the sole (bottom) of your sneaker.

3) Tell about the Hills and Valleys



note- each box is one square centimeter



make a crayon rubbing of the sole of your sneaker

Let's estimate the area of the sole of your sneaker

If a 

is filled in that is one square centimeter (sq.cm

If  is filled in then you have ½ of a box or ½ of a square centimeter. (you can add halves together)

your sneaker ____ square cm.

Friends ↓	
	sq. cm
	sq. cm
	sq. cm
	sq. cm
	sq. cm

Homework-

How can you tell which sneaker has the most surface area?

me and my sneaker

name _____

class _____ group _____

scoring

importance X rating = weighted score

importance: 1 ↔ 3 (1 = not so important, 3 = real important)

rating: 1 ↔ 5 (1 = poor, 5 = great)

1- looks

weighted score

2- comfort

from the first time you put them on

weighted score

3- fit

weighted score

4- dryness

how well do they stay dry in the rain.

weighted score

5- cushioning

softness inside

weighted score

6- stability

how well do they keep your foot from twisting

weighted score

7- bendability

weighted score

8- traction

	Y	N
flex cuts		
dots / waves		
pods		
deep open spaces		
circles		
herringbone pattern		

does it hold the ground well?

8 weighted score

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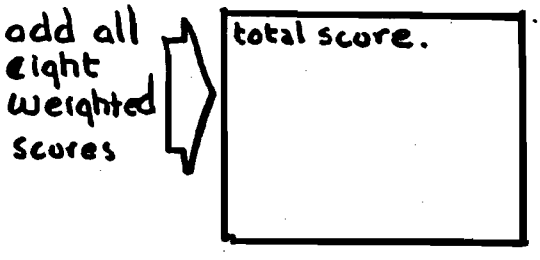
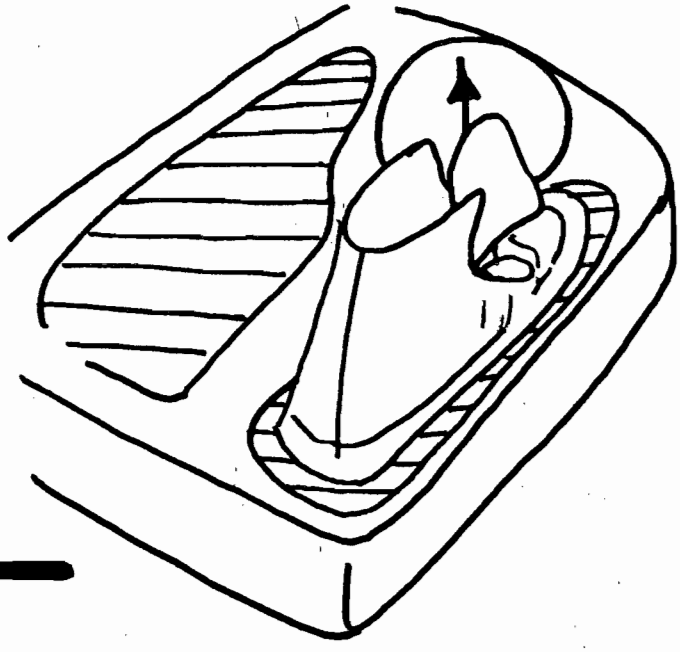
over →

	importance	X	rating	=	weighted score
1	_____	X	_____	=	_____
2	_____	X	_____	=	_____
3	_____	X	_____	=	_____
4	_____	X	_____	=	_____
5	_____	X	_____	=	_____
6	_____	X	_____	=	_____
7	_____	X	_____	=	_____
8	_____	X	_____	=	_____



name _____ class _____ group _____

Can you "stand" the pressure?



parents signature

1) What is the purpose of wearing sneakers?

2) How does rubbing your foot against the ground effect your sneaker?

3) Will a lighter person or heavy person wear out sneakers faster?

Why?

4) define Pressure -

$$\text{pressure} = \frac{\text{your force}}{\text{area}}$$

on Earth the force you exert on the ground (due to gravity) is called your weight

this means $\text{your force} = \text{weight}$

so

$$\text{pressure} = \frac{\text{weight}^{*}}{\text{area}}$$

* in kilograms

area: in square centimeters

note – * weight is in kilograms not pounds

1 Kg = 2.2 lbs.

$\frac{\text{weight (lbs.)}}{2.2\ \text{Kg}} =$ weight in Kg

me pressure = weight * / area $P = \frac{W}{A} = \frac{\text{Kg}}{\text{Sq. cm.}}$ P = _____ Kg per sq. cm.	name _____ pressure = weight * / area $P = \frac{W}{A} = \frac{\text{kg.}}{\text{Sq. Cm.}}$ P = _____ Kg. per sq. cm.	name _____ pressure = weight * / area $P = \frac{W}{A} = \frac{\text{Kg}}{\text{Sq. cm.}}$ P = _____ Kg per sq. cm
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Homework - Which sneaker has the greatest amount of pressure per square centimeter? Why?