



# RENEWABLES

**A covid recovery S3  
Physics Unit**

**VARIABLES**



## THINKING SKILL (2)

- ▶ You go into a shop and buy a bat and a ball. Together they come to £1.10 (I know it's a cheap shop). The bat is £1 more than the ball, so how much is the ball?

<https://www.youtube.com/watch?v=UBVV8pch1dM>

THIS LESSON: TASKS YOU WILL NEED TO COMPLETE

# Variables

Revision of Variables

Choosing variables

Input/output

Controls



# VARIABLES

What is a variable?

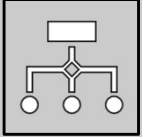
**Variables are what we change or keep the same during an experiment.**



**They are given three names**

- **input / independent variable**
- **output/ dependent variable**
- **Control variables**

**DEFINITIONS**



The **independent/input variable** is the variable the experimenter **changes**, and is assumed to have **a direct effect on the dependent variable**.



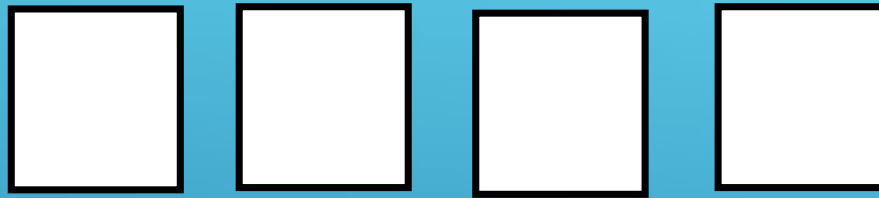
The **dependent / output variable** the variable that is **being measured** or tested in an experiment, and is **'dependent'** on the independent variable



Your **control variables** are all the other variables that **could have an effect** on your experiment so they **should remain the same** throughout the whole experiment

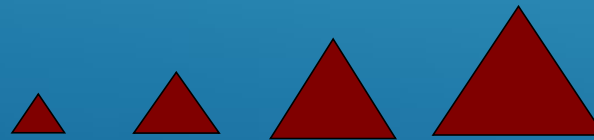
# MORE DEFINITIONS


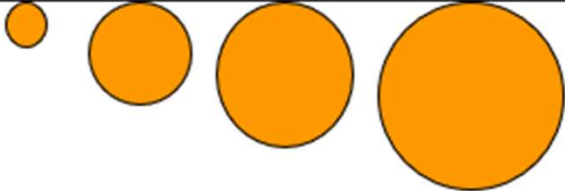
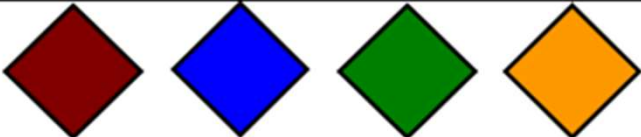

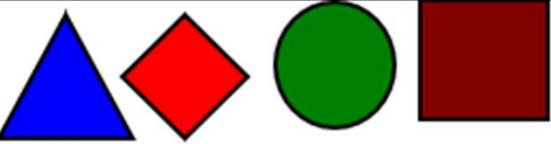
All these objects are the same, **size, shape, and colour**. These three things things (**size, shape, and colour**) are the variables. In our picture the variables are the same. We say they are constant.

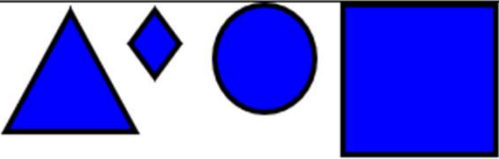
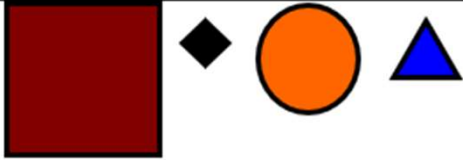


Look at these objects

These objects are the same shape and colour but different sizes. We say that the variable which changes is size and the variables that stay the same are shape and colour.



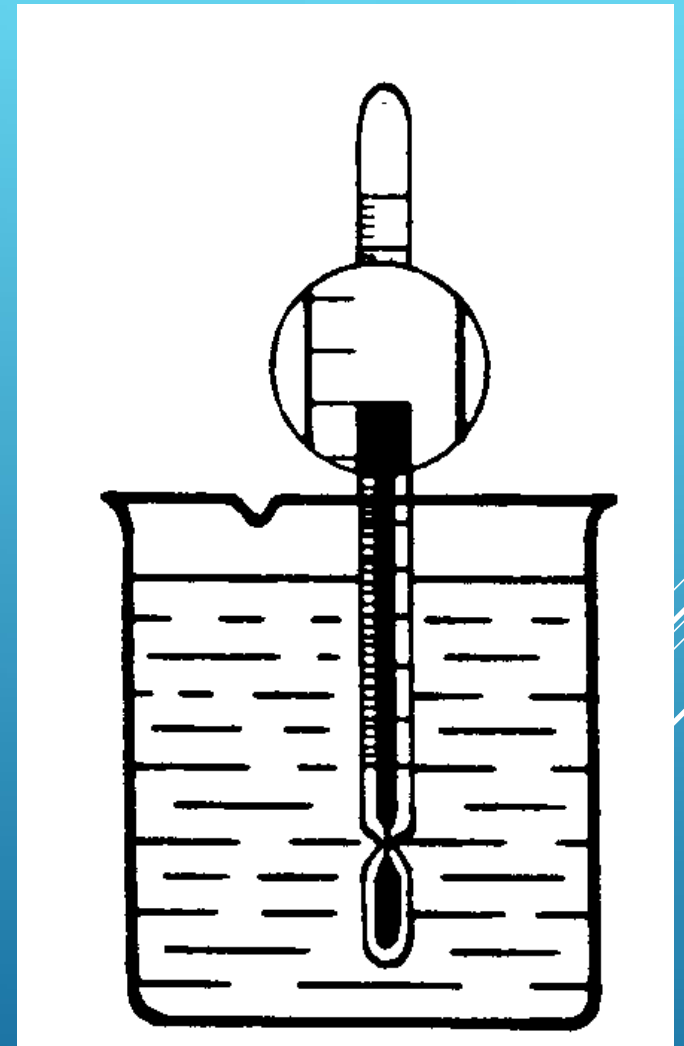
		<u>Variables that change</u>	<u>Variables kept constant</u>
A			
B			
C			
D			
E			

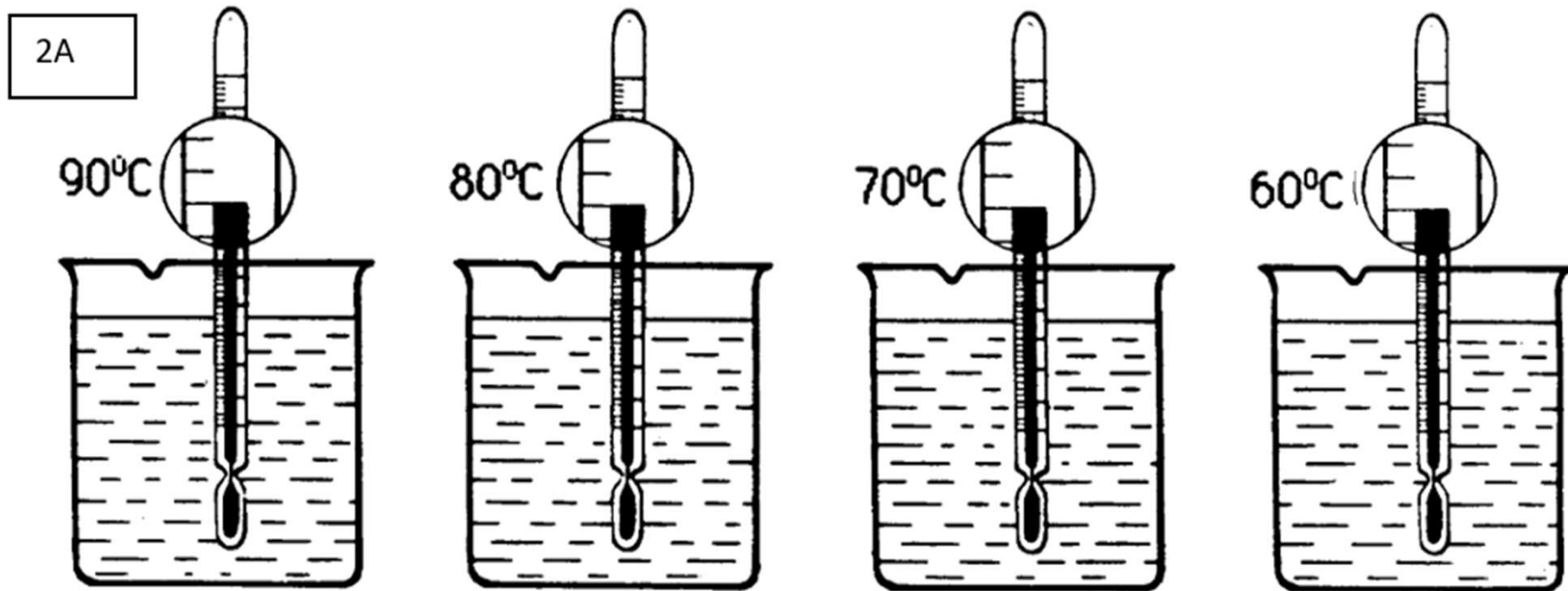
F			
G			



1. We are now going to consider an experiment on heat loss from a beaker of water. Look at this picture of a beaker of hot water. Try to write down things that could be changed in the experiment. (List the variables!)

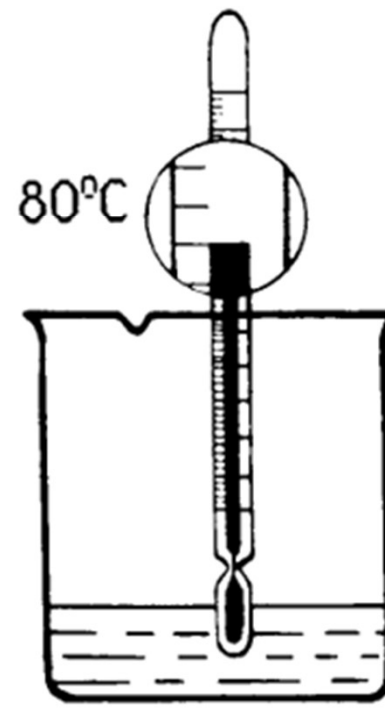
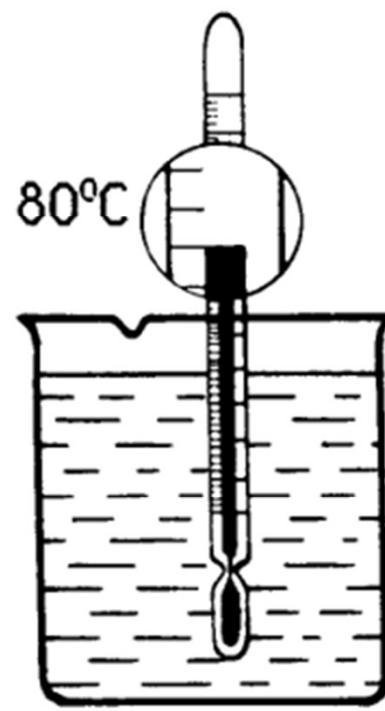
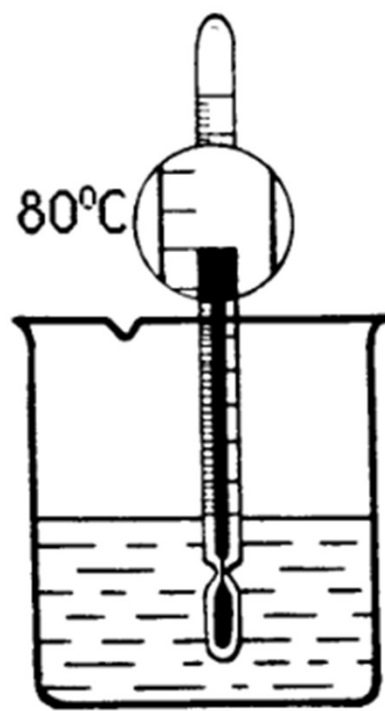
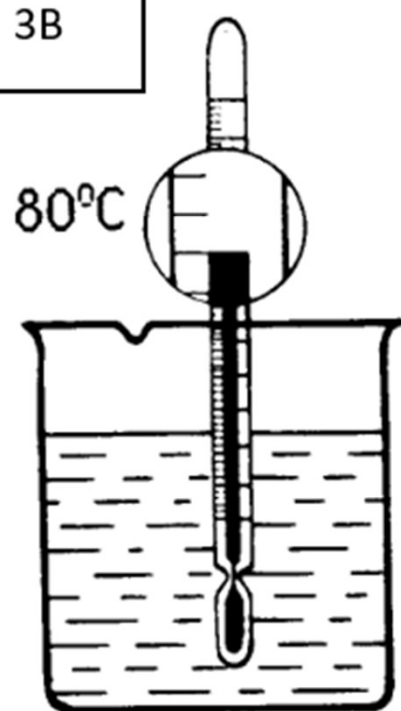
## HEAT LOSS



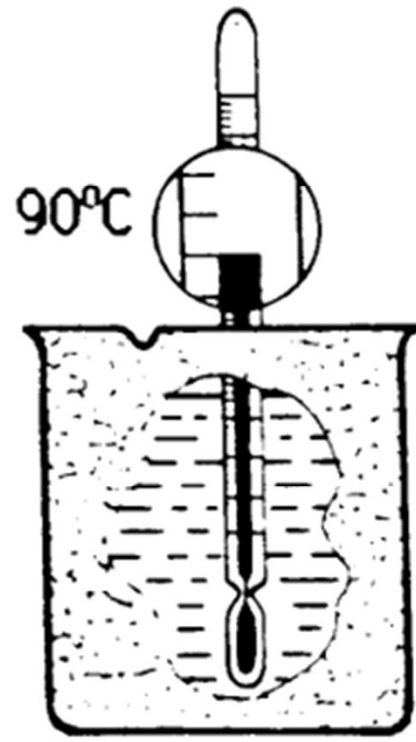
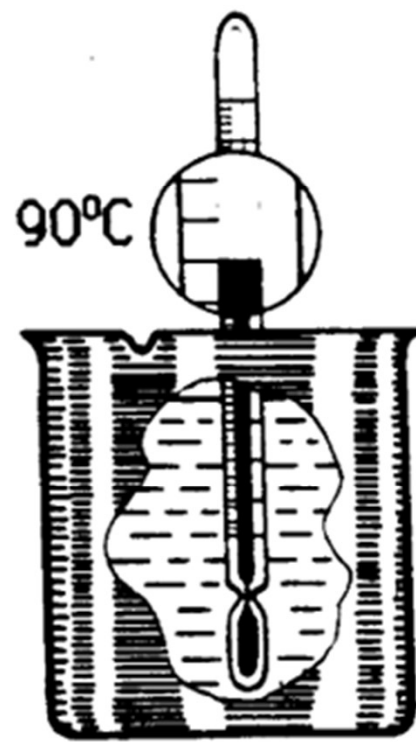
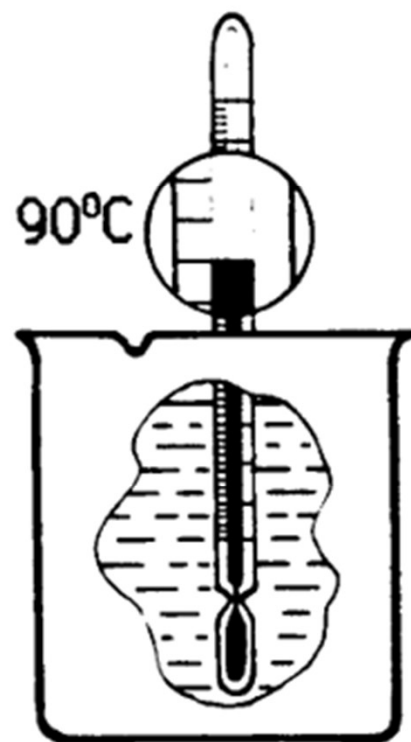
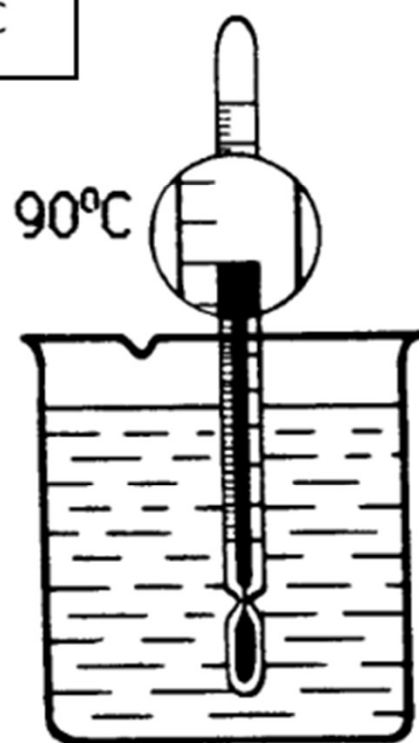


WRITE DOWN WHICH VARIABLES HAVE BEEN CHANGED AND WHICH VARIABLES HAVE STAYED THE SAME.

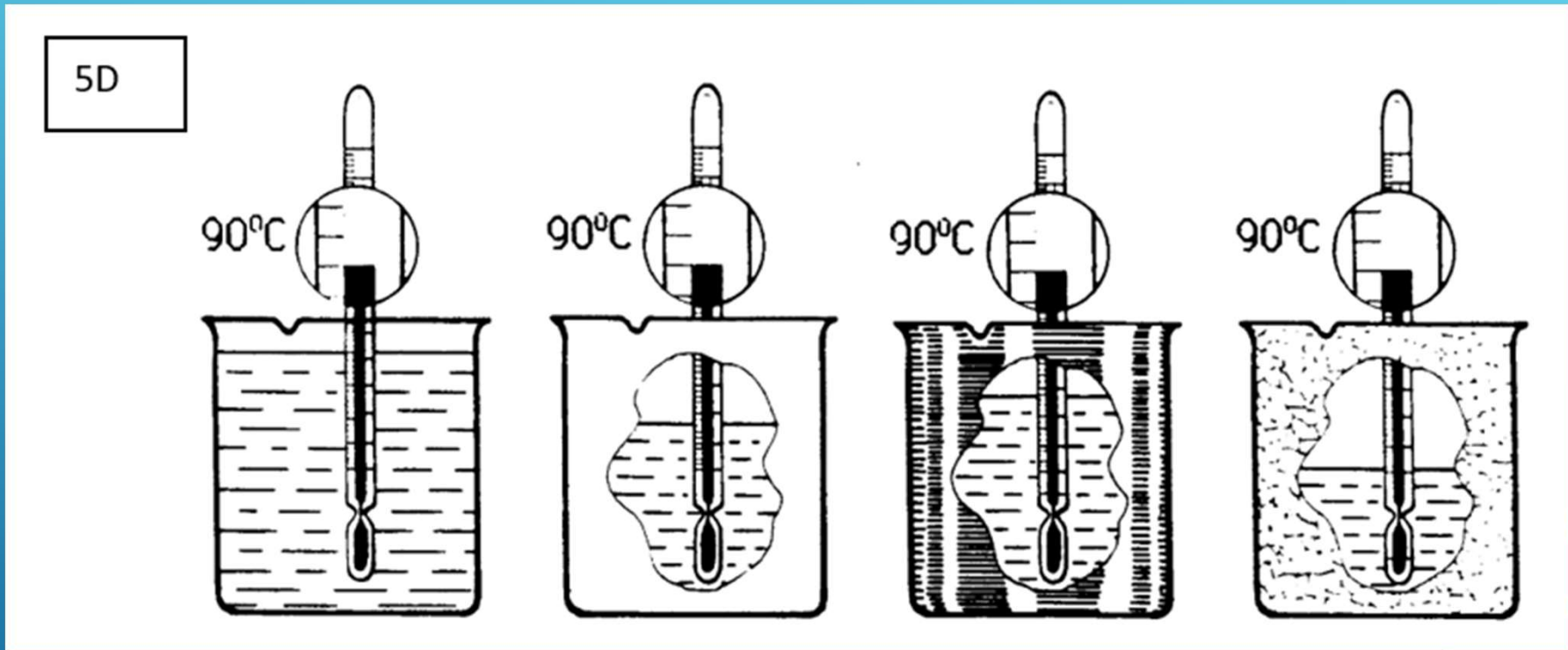
3B



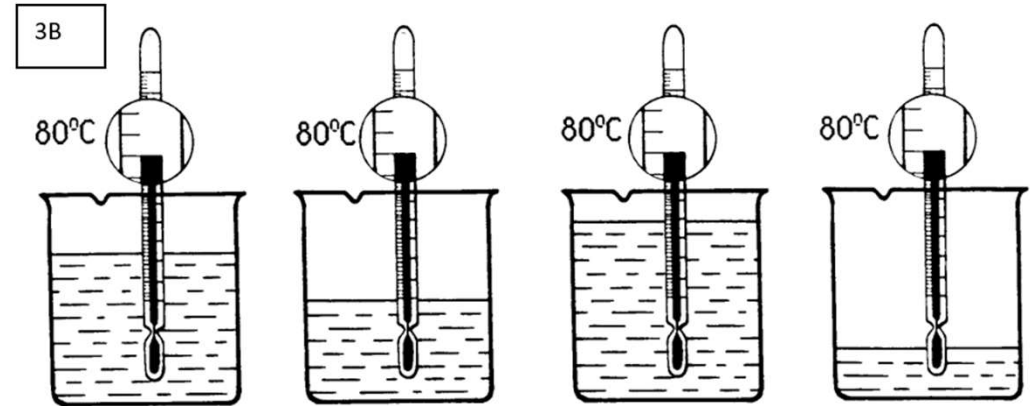
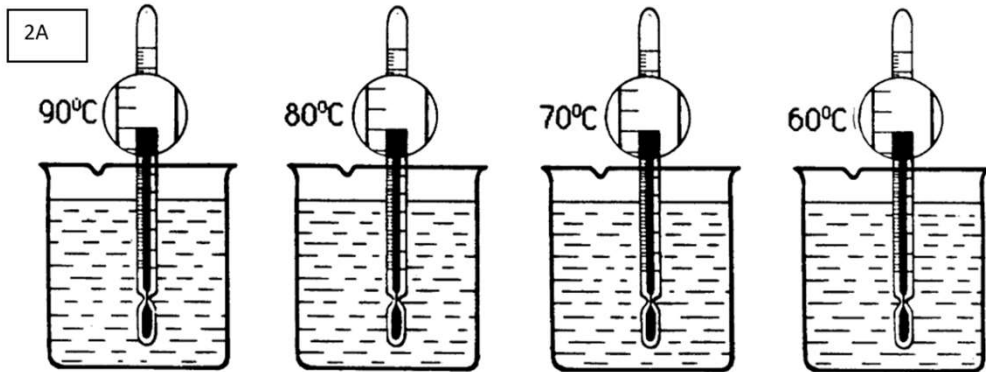
4C



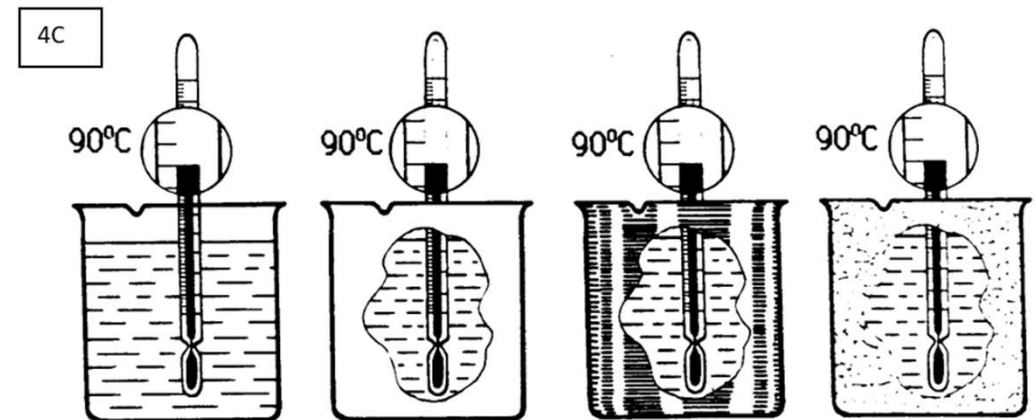
A pupil sets up the following experiment to find out how well different materials keep in heat.



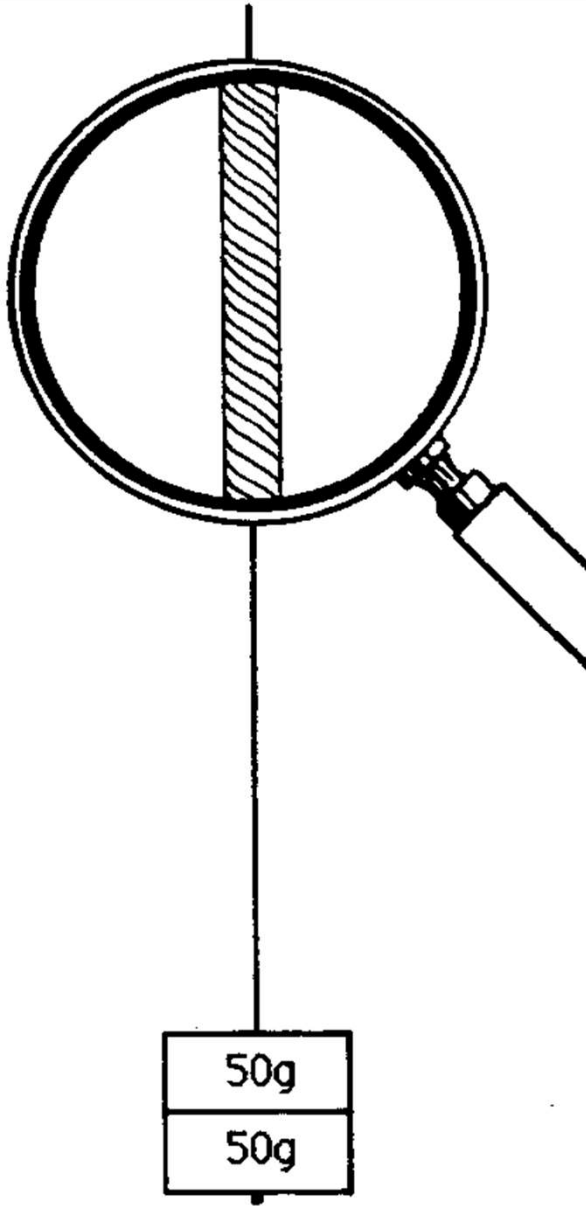
IS THIS A FAIR TEST?



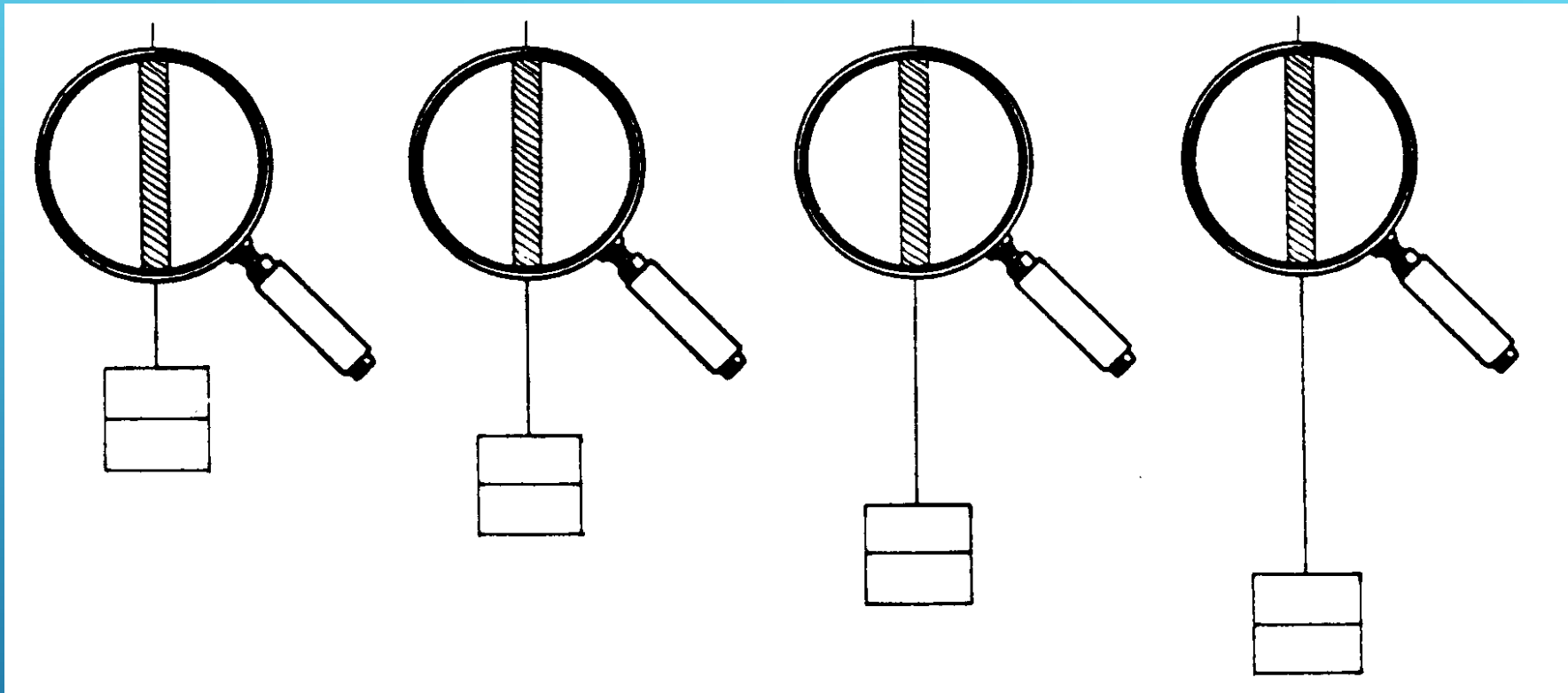
6. IF YOU WERE ASKED TO DO THE SAME EXPERIMENT AS IN 5., WHICH EXPERIMENT FROM 2, 3 AND 4 WOULD YOU USE? WHY?



# STRENGTH OF THREAD



1. an experiment which is designed to test the strength of thread. Weights are added to the thread until it breaks. The strongest thread will be the one which will hold the largest weight.
- Look at the picture then try to write down which things could be changed in the experiment (that is to say, we want to know what the possible variables are in the experiment).

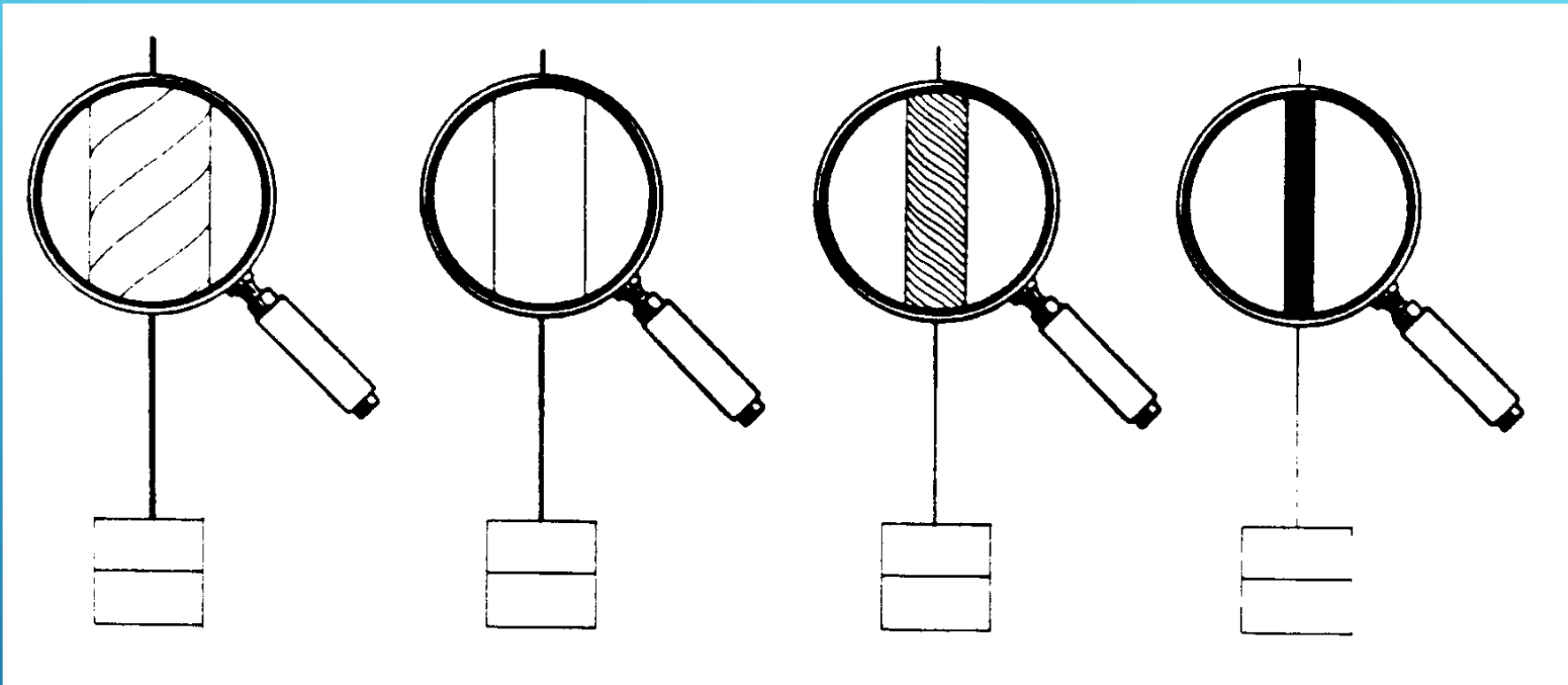


WHAT IS BEING TESTED?

WRITE DOWN WHICH VARIABLE CHANGES AND WHICH STAY THE SAME.

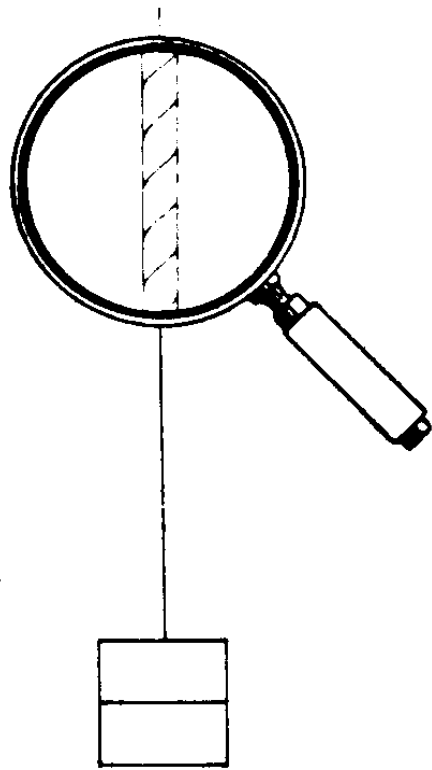
2. experiments to test the strength of threads.



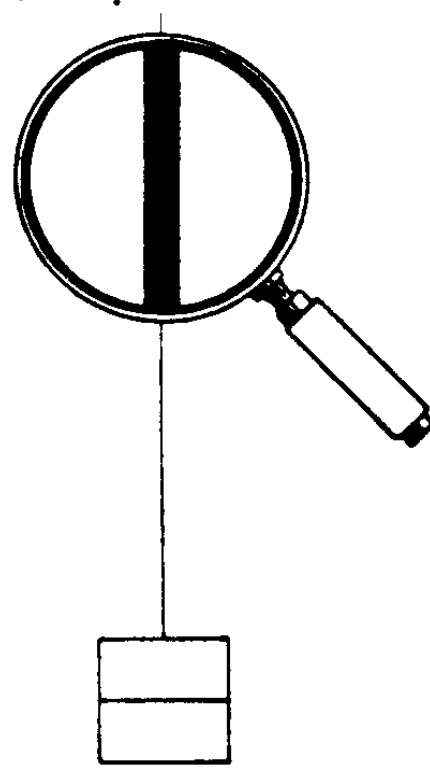


3. WHICH TYPE OF MATERIAL IS STRONGEST?  
FAIR TEST? EXPLAIN

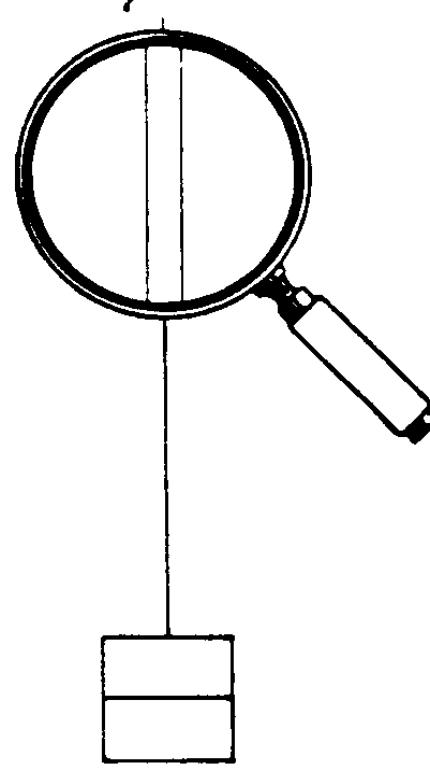
wool



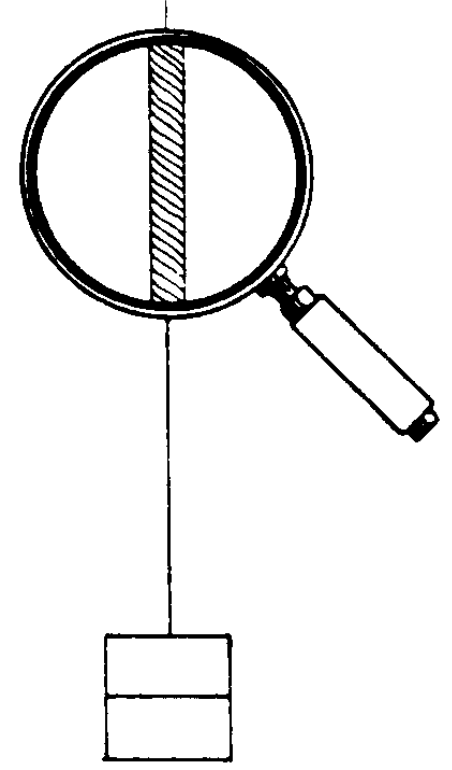
polyester

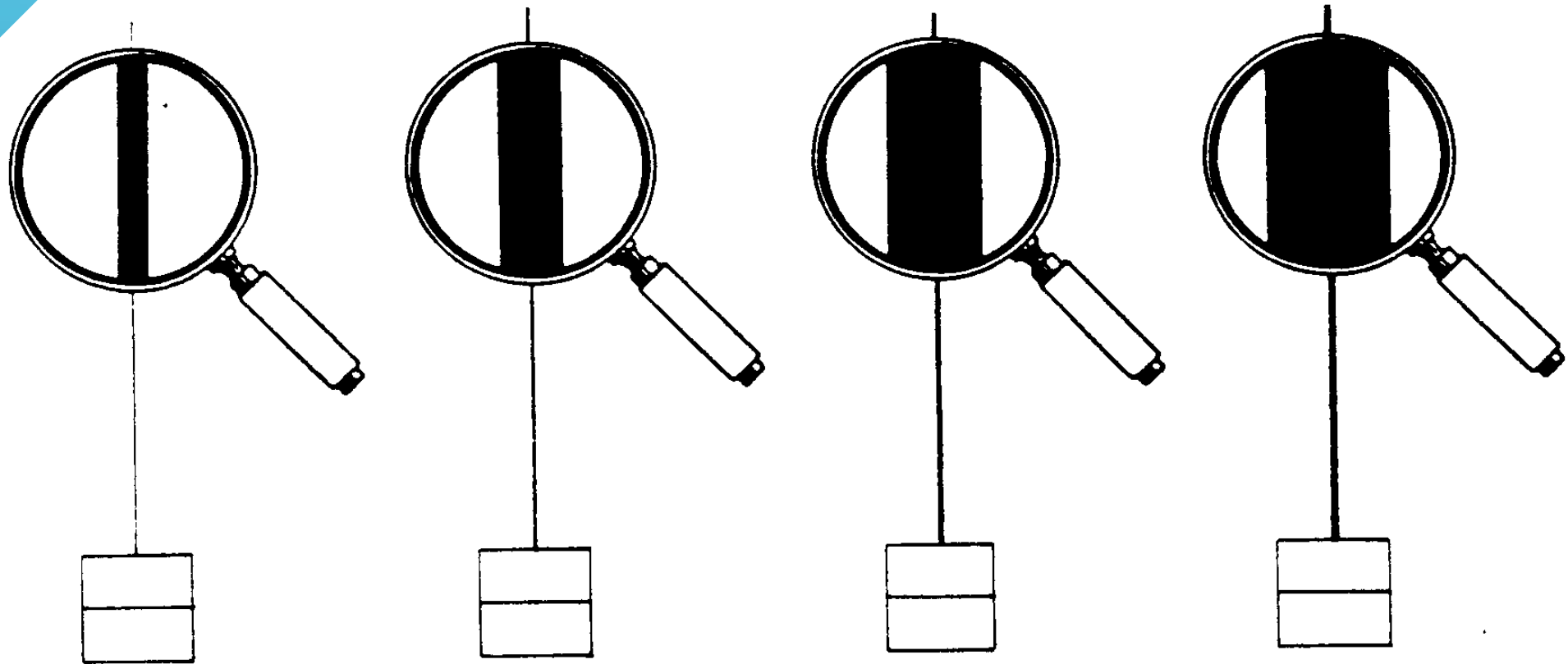


nylon

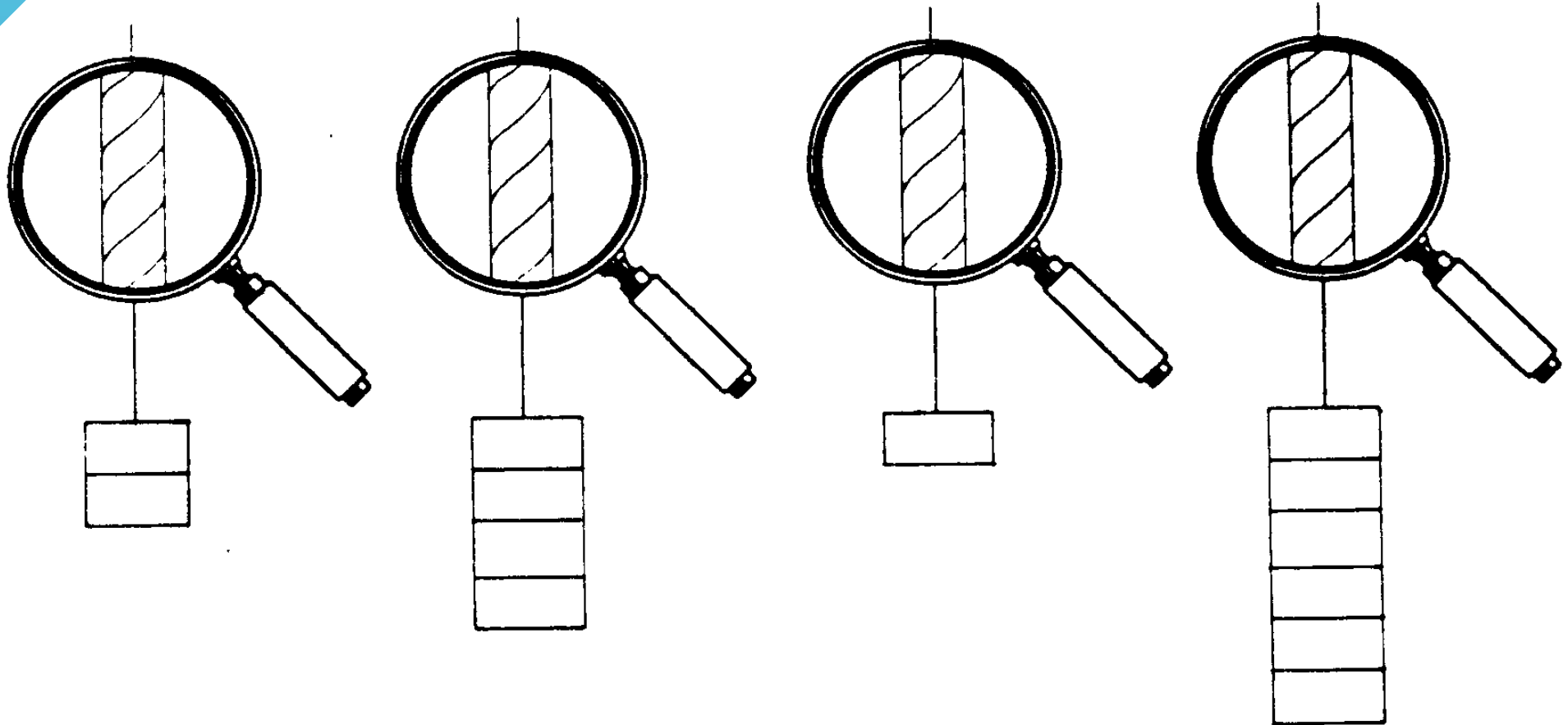


cotton

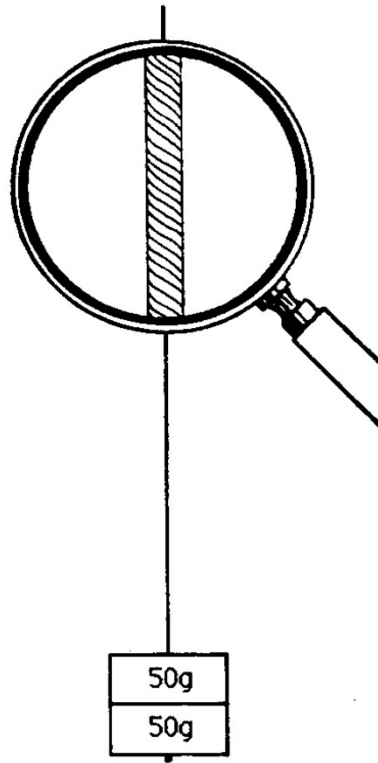




What is being tested? What variables are constant, what variable is changing? Is this a fair test?



6. Look at these four pictures of experiments to test the strength of threads.  
Write down which variable changes and which stay the same.



IF YOU WERE ASKED TO CARRY  
OUT THE SAME EXPERIMENT  
AS IN 6, WHICH EXPERIMENT  
OUT OF 2, 3, 4 OR 5 WOULD  
YOU USE?  
WHY?