



CONNECT**2**COLLEGE

# CONSTRUCTION

## PRE-ENROLMENT RESOURCE PACK

### The Built Environment



# Construction & Built Environment College QUIZ

## DO YOU WANT TO DO WELL ON YOUR COLLEGE COURSE?

*Stupid question? Perhaps - but do you know that statistics show that some of you may leave here without the qualification you have signed up for!*

*So - what goes wrong? Why is it that some people have a great time on their course and go off at the end of it with a shiny certificate and a head start in their chosen **career...** while others wish they hadn't started, give up and leave early with nothing to show for their time at College?*

**Well, you won't be surprised to hear there's no simple answer. Try answering the following questions to find out your score at the moment.**

### QUESTION 1

Have you a pen or pencil to answer these questions?

- A Yes, I like to be fully prepared for all my lessons
- B I always carry a spare pen
- C **I don't need one, my mates always let me borrow one**
- D I never intend to use a pen, I carry all I need to know in my head

### QUESTION 2

Have you started the course with a clear idea of what you want out of it and what you want to do in the future?

- A **I've got a very clear career plan and this course is part of it**
- B **I've got an open mind but I'm fairly sure what I want to do**
- C I know generally, and I hope to find a direction by studying the course
- D I really **have no idea what I want to do...but it is something related to the course**
- E **I don't know what I want to do** - probably nothing to do with this course
- F **I want to be a lighthouse keeper...**

### QUESTION 3

Think back to your last year at school...which of the following statements best describes the amount of time you spent in school?

- A My attendance was perfect....I couldn't keep away
- B My attendance was pretty good...just a few odd days off with illness
- C My attendance was about average...not enough to cause problems
- D Attendance was a problem...for them, not me!
- E Attendance? No comment! Put it this way, my form tutor thought I was a new pupil every time I showed up for registration!

### QUESTION 4

Okay...so you actually made it into school regularly but did you go to lessons or did you hang around the canteen (or somewhere else) all day?

- A No, I went to ALL my lessons!
- B No, unless there was a good reason...I went to almost all my lessons...
- C I went to MOST of my lessons...
- D Sometimes I hung around the canteen, sometimes the bike sheds...anywhere to get away from Maths...or Chemistry...or Physics...
- E What lessons? No one told me there were lessons...

### QUESTION 5

Okay, so you went to lessons...(sometimes) but did you turn up in time to find out what was going on? Which of these statements best describes your punctuality?

- A I was always waiting outside before the teacher arrived.
- B Unless there was a good reason I was always there before the class started
- C I could never understand why lessons always had to start before I got there!
- D I liked to be there in time for the best part of the lesson...the bit where the teacher says, "That's all for today!"

### QUESTION 6

What about essays and assignments? Did you do them ALL for EVERY subject...or SOME for SOME subjects or what...?

- A I did ALL the set work for EVERY subject
- B I did ALL the set work for SOME subjects
- C I did SOME of the set work for EVERY subject
- D I did SOME of the set work for SOME subjects
- C What's all this about set work? No one ever told me about this...

### QUESTION 7

On average, how much of your free time in the evening or at weekends did you spend on schoolwork?

- A At least a couple of **hours each night and at weekends...more when I was** revising
- B **A couple of hours MOST nights...more before the exams**
- C I tried to get it all done in my school study periods
- D I could never work at home - too many distractions/nowhere to work
- E **I couldn't do any...If I'd taken schoolwork home my parents would have died of** shock



### QUESTION 8

**So...if you were not doing schoolwork, what WERE you doing in the evenings?**

On average how many weekday (Monday-Friday) evenings were devoted to your social life?

- A None - I just went out at weekends (Saturday/Sunday)
- B One at most
- C Two, sometimes three
- D Up to Four - **I'm the popular type!**
- E Up to Eight! My social life is so hectic one week just blurs into another!

### QUESTION 9

Which of these statements best describes how you got on with your teachers at school?

- A I was like a son/daughter to them!
- B No problems - I got on well with them all
- C I got on with most of them - there were exceptions
- D **Few of them liked me so I didn't like them**



### QUESTION 10

How often did you talk in lessons and distract other students?

- A Never - I was there to learn
- B Hardly ever - **only things like "You've just set your clothes on fire with that Bunsen Burner"**
- C Rarely - I was usually too busy with my work
- D Sometimes - depended if I felt like a chat
- E Often - I enjoy talking to my friends - wherever I am
- F Always - I much prefer the sound **of my own voice to the teacher's!**

### QUESTION 11

Which of the following best describes the response you had at home when you decided to attend College?

- A Fantastic - they even helped me to find the best course
- B Great - they are behind whatever I want to do
- C **They support what I'm doing as long as they think it's worthwhile**
- D **They don't take a lot of interest but they support me**
- E They want me to get a full-time job...

### QUESTION 12

Do you have brothers and sisters who have gone to College or University?

- 1) Yes
- 2) No
- 3) **No (because I'm an only child!)**
- 4) No (because I am the eldest child)



If you answered 'Yes' what is the highest qualification they have achieved?

- A Postgraduate (Doctorate, Masters Degree)
- B Degree or HND
- C A Levels, AVCE, BTEC Nat Dip
- D Other qualification (e.g. qualified secretary, plumber, electrical engineer, etc.)
- E **Don't know**



## Health and Safety Questionnaire

**Please answer this questionnaire in full, sign it and return it to your tutor.**

1. Who would you report a Health and Safety problem to?
2. What are your responsibilities for Health and Safety?
3. Give five different types of Health and Safety hazards.
4. Name four types of fire extinguishers and the type of fire they should be used on
5. List four possible causes of fire.
6. What action can be taken to minimise the risk of fire?
7. Why is it important to report incidents?

**Print Name:**

**Signature:**

**Date:**

# Science and Materials

## 1 Introductory activity

The module title contains two key words *science* and *materials*. Taking each of these two key words in turn, identify by listing against each what you consider would be examples that have been used or applied in a modern domestic house.

**SCIENCE**

**MATERIALS**

## 2 Human comfort

This activity asks you to focus on your own human comfort within the environment that you live in. Identify what makes you comfortable and uncomfortable within your own home.

Imagine yourself now at home, look around your house within your mind and list against each of the following items what you can identify that can be dropped into each of the table's boxes.

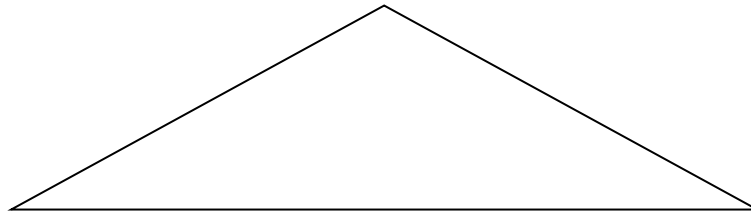
Comfortable/ Desirable	Uncomfortable/ Undesirable

They need to be specific to how they make you feel!

## 3 Structural members

Identify from the following examples, by annotation, which members within the frameworks are struts, ties, braces, columns and beams.

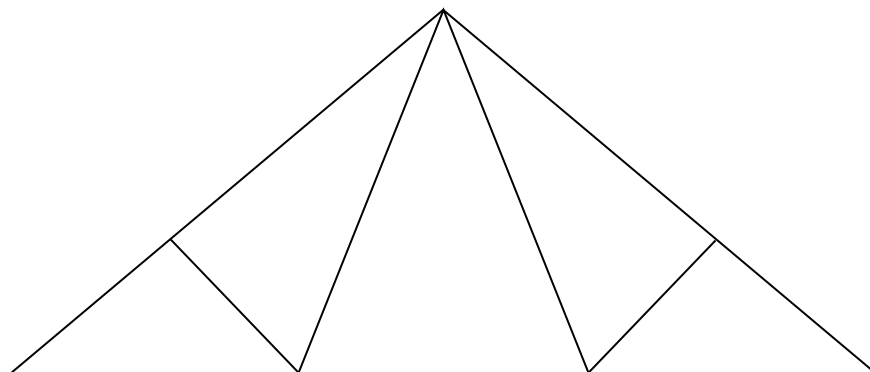
### Example 1



### Example 2



### Example 3



## 4 Stress and strain

The tutor has asked you to undertake some calculations associated with the stresses within the frame members, using standard formulae.

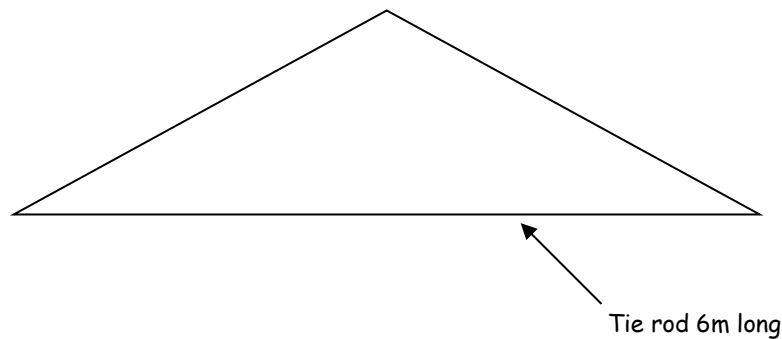
### Formulae

$$\text{Stress} = \frac{\text{Force}}{\text{Area}}$$

$$\text{Strain} = \frac{\text{Extended or reduction in length}}{\text{Original length}}$$

### Exercise 1

The steel bar tie rod in the roof truss below is subject to a load of 200kN. The radius of the tie rod is 17.5mm. Calculate the value of stress in  $\text{kN/mm}^2$  within the steel tie rod material.



### Exercise 2

The tie rod under this load was measured during manufacture as 6.00 metres long. After the load has been applied it was re-measured on site as 6.08m long. Calculate the strain that has occurred.

## 5 Fit for purpose

You have to be able to identify fit for purpose materials for identified locations in a domestic building. Each fit for purpose material is then researched to provide a list of properties for the materials in question.

The following two sets of design data have been provided by the architect on a project your company is supplying the materials for. Using this data suggest a material for the given data and application.

In each case:

1. Make a valid and appropriate decision relating to the specification. That is, why did you choose one material over another?
2. Relate the properties of the material to the performance in use.

### Scenario 1

This material will be used below the damp-proof course of an external wall, within the substructure location of a foundation. The material must be capable of resisting  $3\text{N/mm}^2$  of compressive force. The material will be subjected to the external elements of the weather. Aesthetics is only an issue with the short exposed piece of material below damp-proof course and above existing ground level.

### Scenario 2

This material will be subjected to natural ventilation, and is expected to span 4 metres. It should have economical cost properties and be able to flex under wind loadings. It must resist insect and fungal attack, and be of a naturally occurring sustainable specification. The material must be available in a range of sizes. The material is not subjected to the direct effect of the weather elements, and aesthetics is of no concern.

When you have two materials identified undertake some research on the properties of each.

## 6 Control of substances hazardous to health (COSHH)

The tutor has asked you to take a closer look at three materials and their incorporation into a domestic dwelling with regard to the control of substances hazardous to health. Each material needs investigation to provide advice as to fit for purpose. You may require access to the internet.

### **Material 1**

It is proposed to use urea formaldehyde insulation cavity foams for a proposed extension. Is this acceptable?

### **Material 2**

A profiled asbestos cement roof sheet has cracked and you require a replacement.

### **Material 3**

A lead damp-proof course is proposed to a listed heritage building to replace a defective part.

## 7 Timber production

You have been asked to investigate where the timber we use in the UK is grown and processed, the types used and the resultant end product. Answer the following questions from your research.

1. What types of timber do we use for construction?
2. Where are they grown in the world?
3. How is a tree processed?
4. Is the product dried out and how?
5. Is the raw timber processed into other timber products?

## 8 Types of material

You have been given a box of typical construction materials. For this activity you need to identify three materials and describe some of their properties. Answer the following questions.

1. Identify each.
  
  
  
  
  
  
  
  
  
  
2. Identify where it is used in a structure.
  
  
  
  
  
  
  
  
  
  
3. Identify three properties of each.

## 9 Types of deterioration

Taking the three materials identified in activity 4.10 answer the following question.

How might each material deteriorate over time and what is the cause?

	Possible deterioration	Cause
Material 1		
Material 2		
Material 3		

## 10 Remedial action

Taking the table formed from activity 4.11 add in another column for remedial action and identify a way in which this deterioration could be prevented, stopped or controlled for each material.

	Possible deterioration	Cause	Remedial action
Material 1			
Material 2			
Material 3			

# 11 Ventilation and thermal losses

A domestic semi-detached dwelling is subject to 1.5 changes per hour. Calculate the total heat loss due to ventilation. In this example we have removed the circulation space which is uninhabited.

## Room Dimensions

Lounge 3.5m x 3.5m

Kitchen/diner 4.0m x 2.5m

Bedroom 1 3.0m x 3.0m

Bedroom 2 2.75m x 2.75m

Bathroom 2.5m x 2m

Storey height is 2.4m

Air changes for all rooms 1.5 per hour

Temperature difference -1°C outside, 19°C inside.

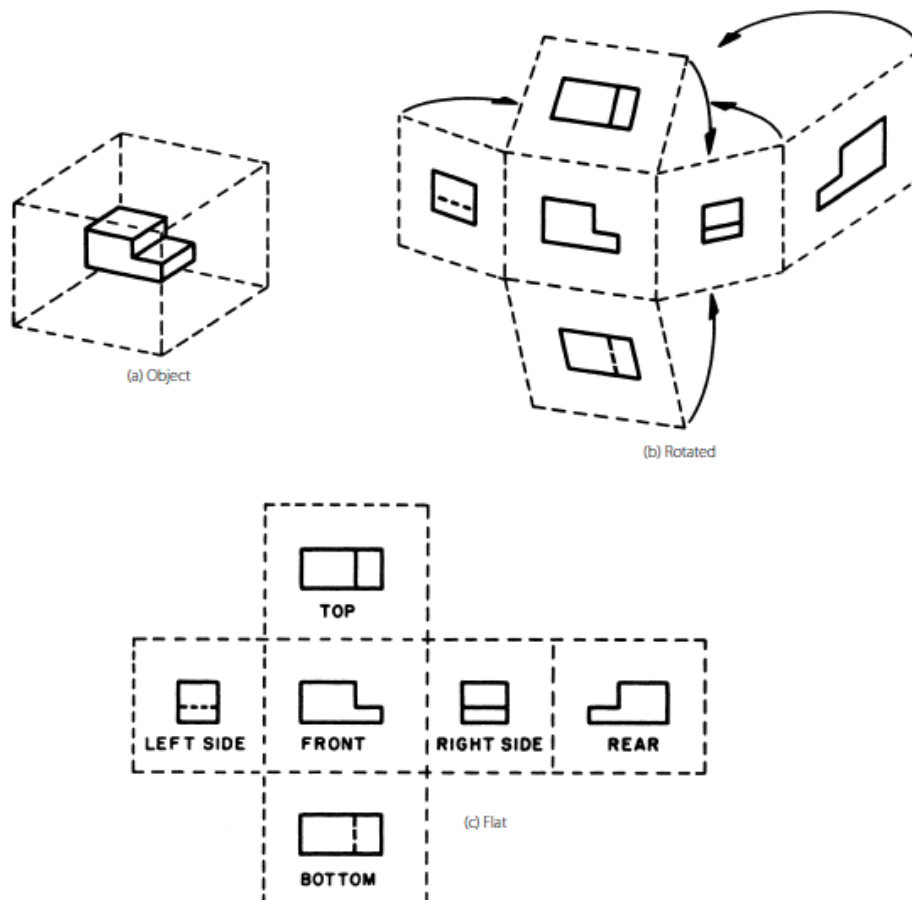
# ORTHOGRAPHIC PROJECTION.

**Definition:** common method of representing three-dimensional objects, usually by three two-dimensional drawings in each of which the object is viewed along parallel lines that are perpendicular to the plane of the drawing.

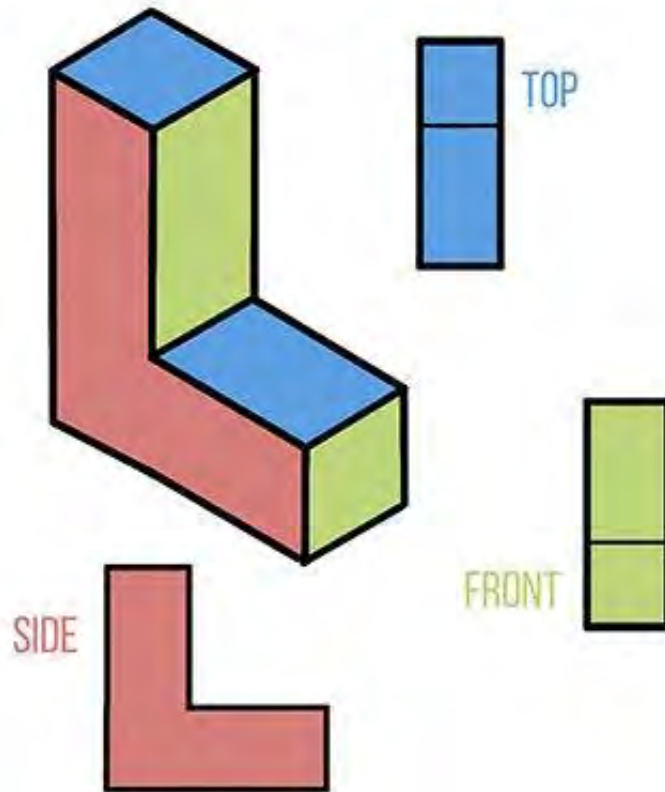
## Why we need it in construction and the built environment?

Your knowledge in orthographic projections enable you to draw and understand engineering drawings and details. For example an orthographic projection of a house typically consists of a top view, or plan, and a front view and one side view (front and side elevations).

It is essential for your course and you will be learning more about it in Graphical detailing, CADD and Building information.



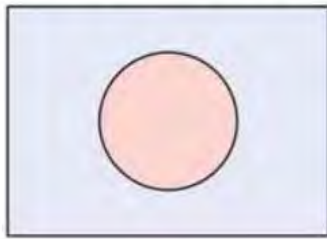
## Examples:



The **isometric view is on the left** and the orthographic view is the 2D planes broken down into separate pieces, on the right and below.

As you can see with the image above, there is quite a difference between an isometric view and an orthographic view, but you can create one from the other!

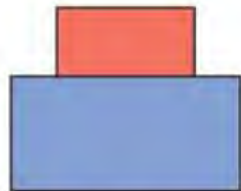
## Orthographic and isometric projections of an object



top view

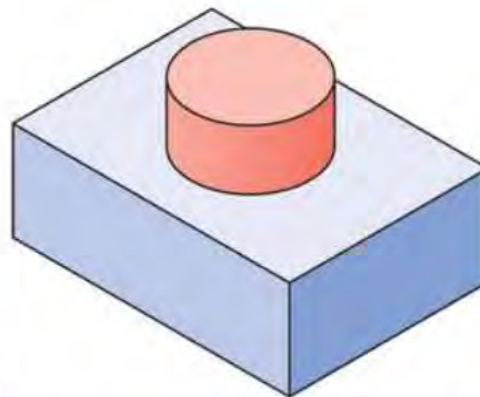


front view



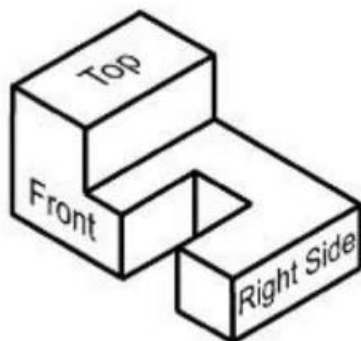
side view

2-dimensional orthographic projection

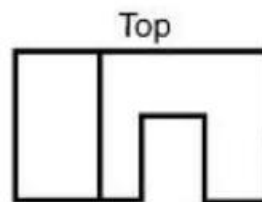


3-dimensional isometric projection

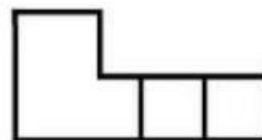
© 2012 Encyclopædia Britannica, Inc.



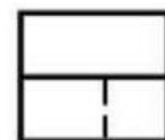
3D Representation



Top



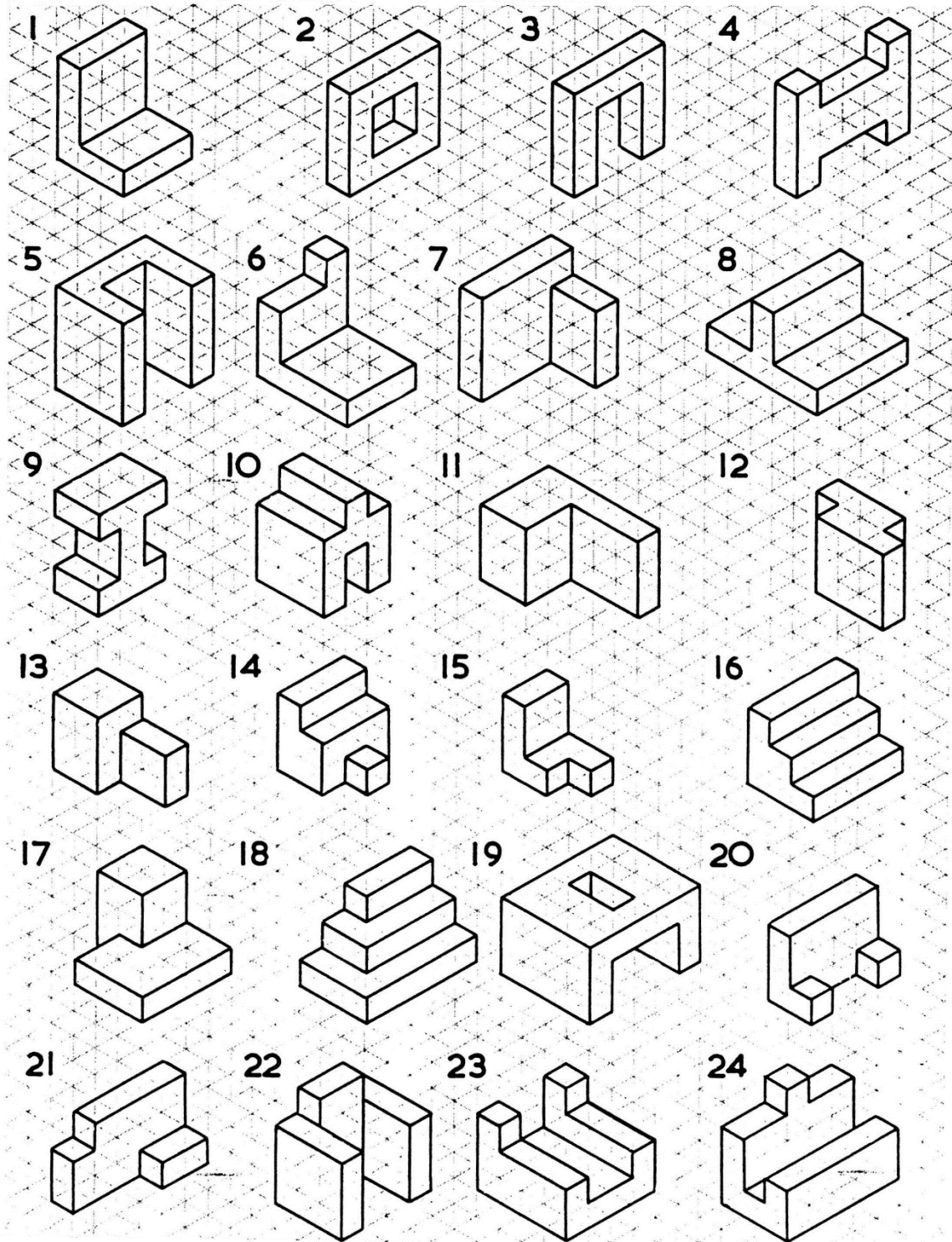
Front



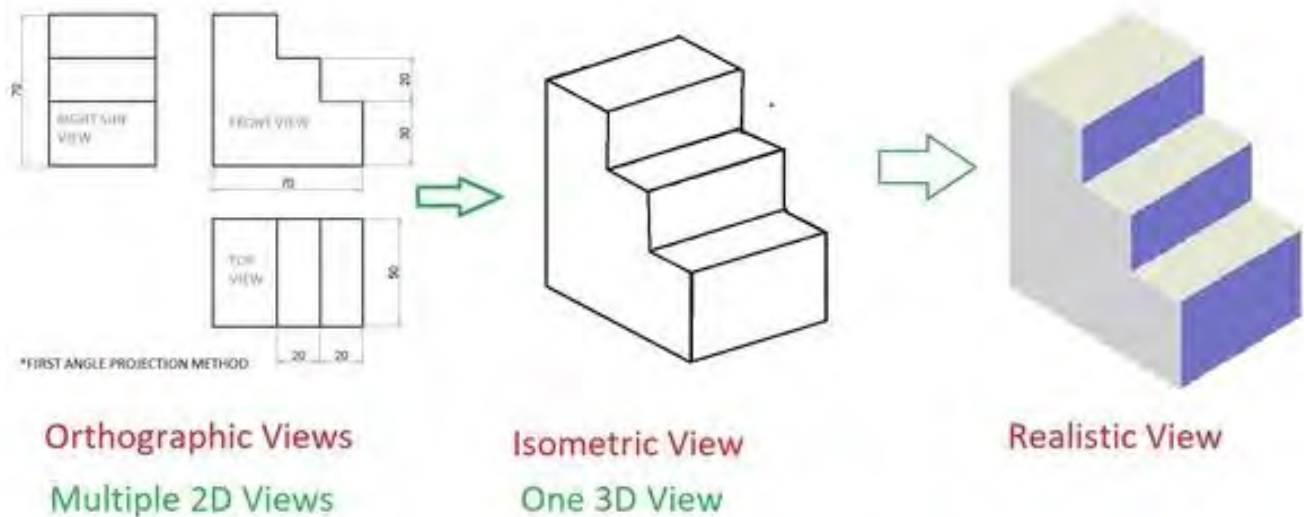
Right Side

2D Orthographic Projection

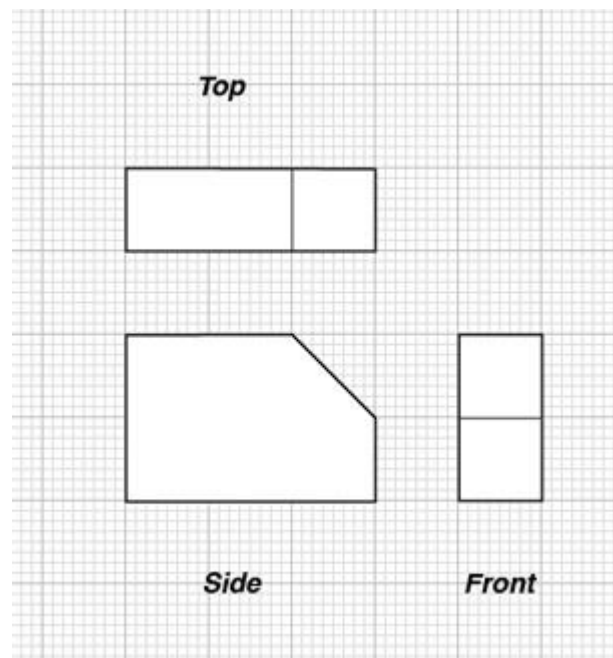
Can you draw out the different projections for these shapes?



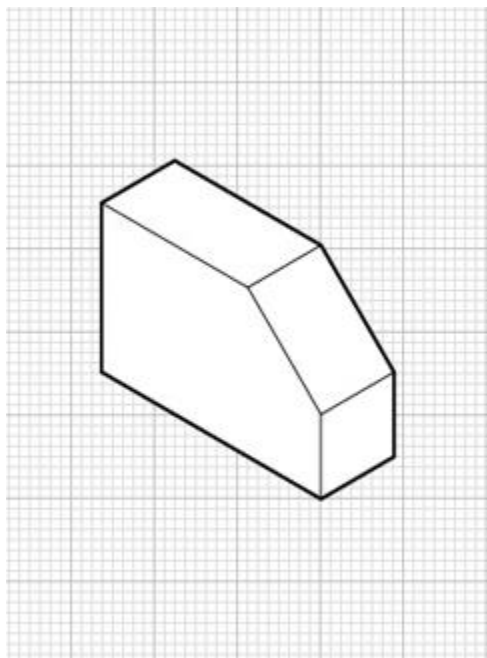
Now, can we draw an isometric if orthographic projections were given?



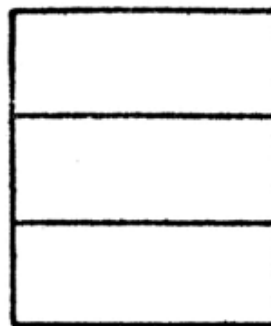
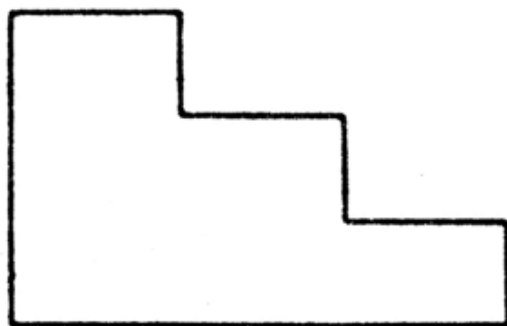
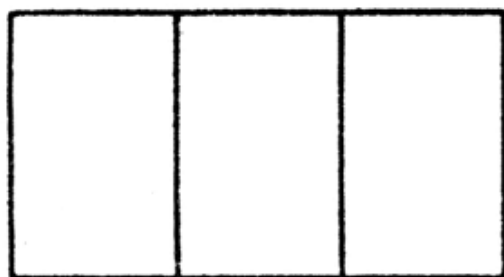
Yes, we can. Try with a simple shape like this:



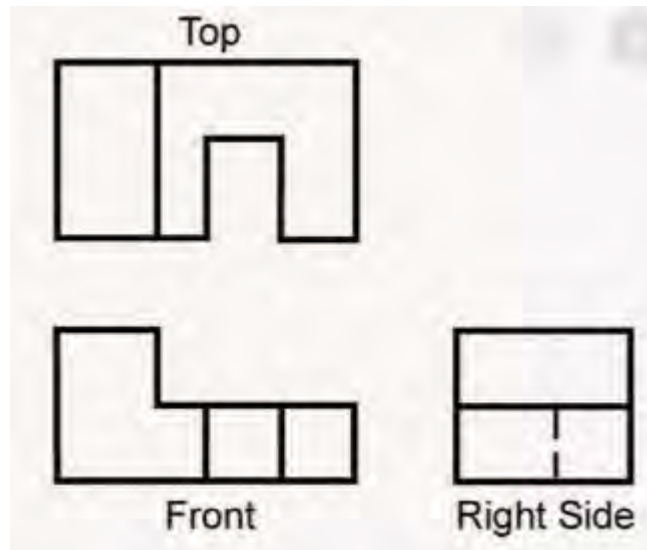
**Answer:**



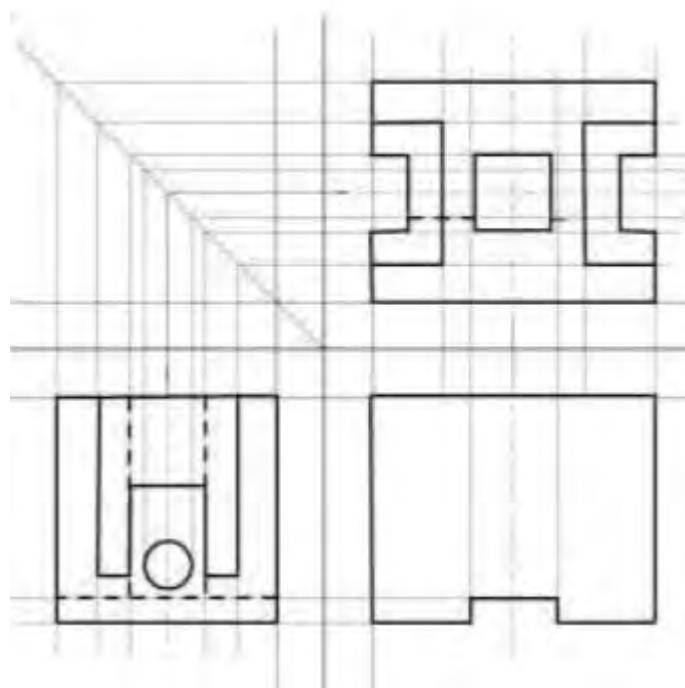
**Now, can you work out this one?**



**And, this one?**



**And....**



**Good luck and hope to see you soon.**

Heba N. Sabboubeh  
 Teacher in Construction and Built Environment.