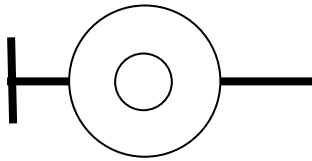


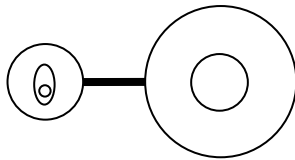
# 2.11 Plans and Elevations

- If you can lay your hands on some real architect plans/blueprints, that would show the relevance of this topic. Or pupils could bring in diagrams from instructions for putting together some object such as a bookcase, a climbing-frame or a model. Notice how hard it would be without the diagrams.
- Pupils could look at home for optical illusions that depend on different points of view. Perhaps there are artists who have exploited views of common objects from unusual angles in their work.
- You may be able to find satellite photographs and aerial photographs on the internet – perhaps of the local area.
- Pupils with experience of playing certain types of computer games may have an advantage with this topic!

2.11.1 You can start with “A Mexican on a bicycle”,



and “A Mexican frying an egg”!



2.11.2 **NEED** interlocking cubes, “What are these objects?” sheets.

*Some pupils (and teachers!) find this sort of task very hard.*

*Objects with planes of symmetry (how many in brackets): 1 (2); 2 (1); 3 (1); 5 (1); 6 (1).  
Objects 4 and 7 are the only “chiral” objects among these; they are non-superimposable mirror images of each other (like enantiomers in Chemistry).*

2.11.3 Escher (1898-1972) drawings are very impressive to look at. Pupils could attempt some “impossible drawings” on isometric paper.

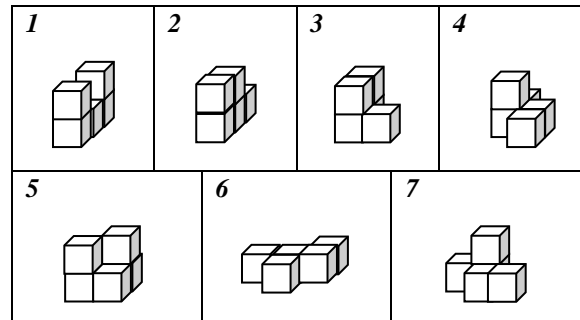
2.11.4 Scale Drawings. This topic could be tied in to work on scale drawing by making “architect’s plans” for a room or floor at school, at home or elsewhere.

*If pupils have access to a camera they could photograph “common objects” viewed from unusual angles to produce a set of puzzles. (For each object you also want a view from a more usual angle to use as an “answer”).*

*Skip the Mexican idea if it might offend someone.*

*Pupils may know of other drawings like this.*

*Answers: There are 29 pentacubes altogether. The 7 used are shown below.*



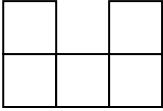


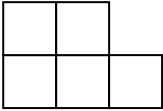


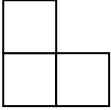
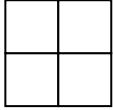
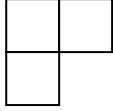
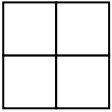
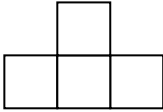
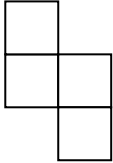
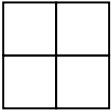
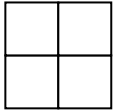
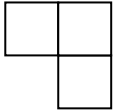

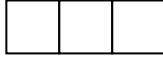
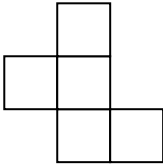
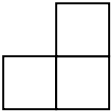
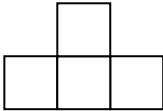
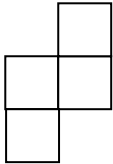
*Many books have suggestions of impossible drawings.*

## What are these Objects?

All of these objects are made out of 5 interlocking cubes.

There are three different views of each object.

Try to make the object and draw it on isometric paper.

	<i>front view</i>	<i>left side view</i>	<i>plan view</i>
<b>1</b>			
<b>2</b>			
<b>3</b>			
<b>4</b>			
<b>5</b>			
<b>6</b>			
<b>7</b>			

Which objects have a plane of symmetry?

Which two objects are mirror images of each other?