

# THE EVOLUTION OF SCREWS AND NAILS

## **Purpose**

*To illustrate the ways by which an evolutionary sequence is worked out from fossils.*

## **Instructions**

*The screws and nails represent the fossils found in a sequence of five separate beds.*

*The bed from which each fossil comes is indicated by the colour of the paint on it.*

*The stratigraphic sequence is:*

*blue represents fossils from the youngest bed*

*red*

*grey*

*green*

*yellow represents the fossils from oldest bed.*

- 1. Clear a large area on your desk and place a sheet of A1 size paper on it.*
- 2. Examine the "fossils" and list or draw the main variables found in them.*
- 3. Sort the "fossils" into groups of like colour. Then spread each group out in a line so that the lines are in stratigraphic order with the youngest group furthest away from you and the oldest closest to you.*
- 4. Try to work out an evolutionary sequence for the "fossils". Keep the "fossils" in their lines so that no evolutionary tree has more than five stages. There is no correct solution but you must be able to justify your own sequence. Which are the problem "fossils"? Draw lines to show your evolutionary tree and write what type of change is taking place at each place on the lines. Be careful when drawing the lines not to displace the screws and nails, they roll very easily.*

5. Try to find examples of each of the following:

- continuous evolution*      *one fossil continuously changing in the same direction*
- divergent evolution*      *one fossil giving rise to two or more new forms*
- a radiation*      *one fossil giving rise to several new forms of life in a short period of time.*
- stasis*      *a "fossil" which remains unchanged for a long time.*
- an extinction of a line*      *A life form ceasing to exist without evolving into another.*
- convergent evolution*      *Separate groups evolving to resemble each other.*
- parallel evolution*      *Separate groups evolving in the same manner.*

## **Teacher's Section**

### **Requirements**

*A large variety of nails, tacks, brads, screws, bolts, rivets etc. These should be chosen so that they show the types of evolution listed in instruction 5.*

*5 small screws and nails painted yellow*

*12 screws, nails and bolts painted green*

*13 screws etc painted grey*

*14 screws etc painted red and 15 painted blue. The grey and blue ones will be mostly larger sizes.*

### **Notes**

*It is not possible to write a written report but it is possible to put all the fossils on an A1 sheet of paper to draw onto it the evolutionary tree and to write on the sheet what changes are occurring. Some of the variables are:*

- composition: steel, brass, aluminium, black painted*
- length*
- thickness*
- shape of cross section: round, oval, square*
- head: round, countersunk, slotted head, cross head,*
- type of thread, length of thread*

***Time***  
***45 minutes***

