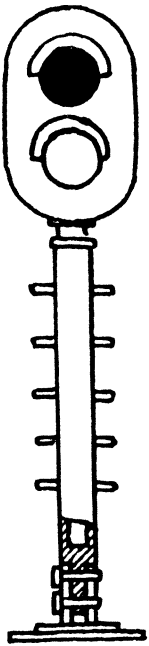
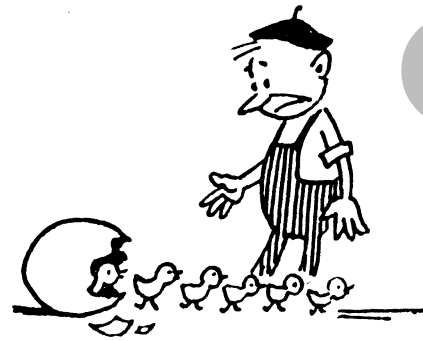
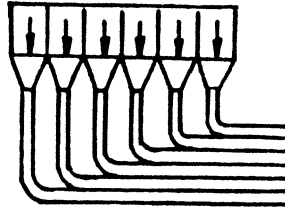


Segmentation

1

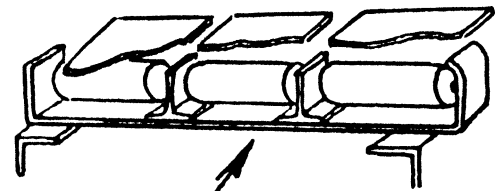
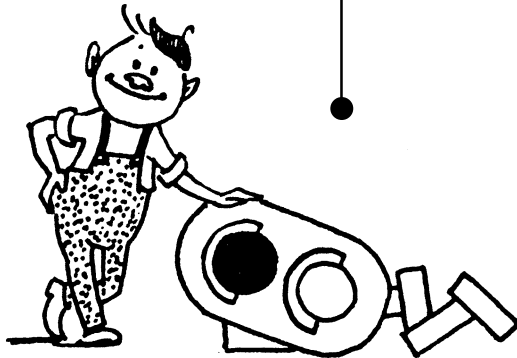
A. Divide an object into independent parts.

A 90-degree elbow in a large air duct is segmented for better air flow and turbulence reduction.



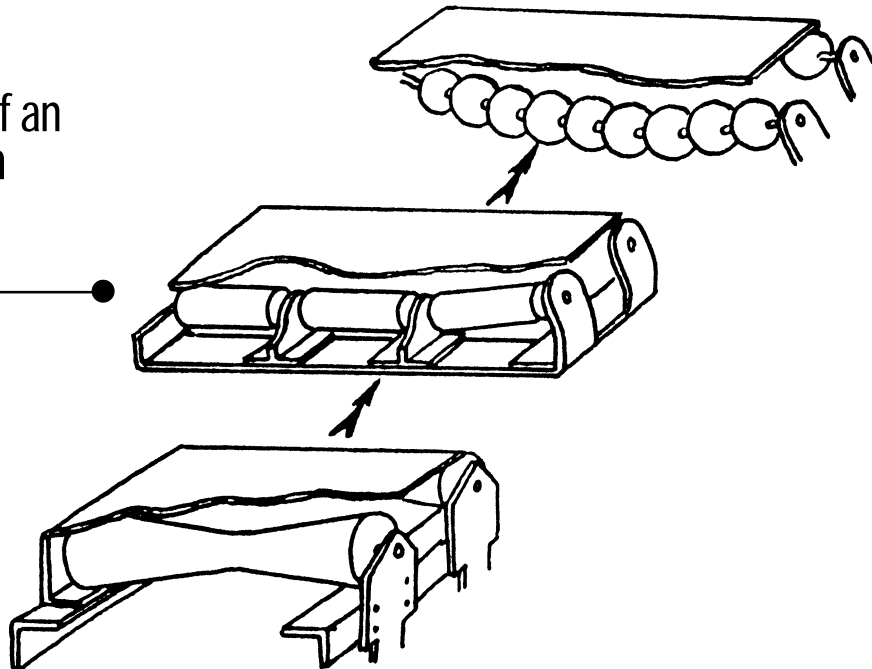
B. Make an object sectional
(for easy assembly and disassembly)

The pole of a temporary street light is made of elements connected with flexible joints for easy transportation and installation.



C. Increase the degree of an object's segmentation

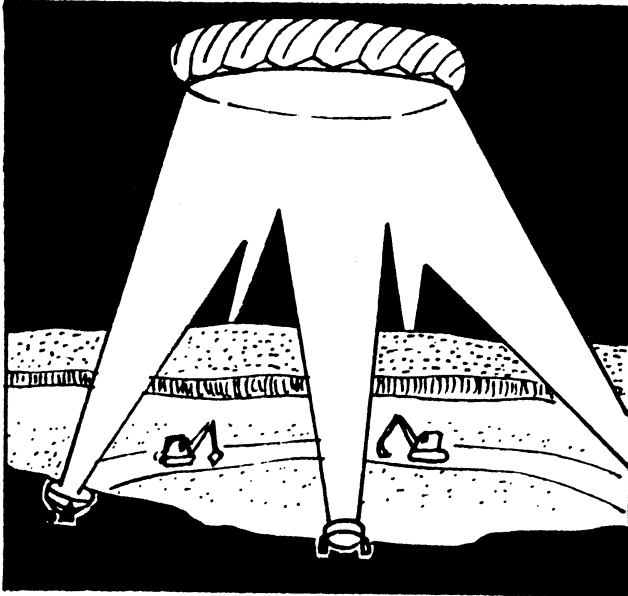
Development of a Roller Conveyor.



Extraction

(Extracting, Retrieving, Removing)

A. Extract the “disturbing” part or property from an object.



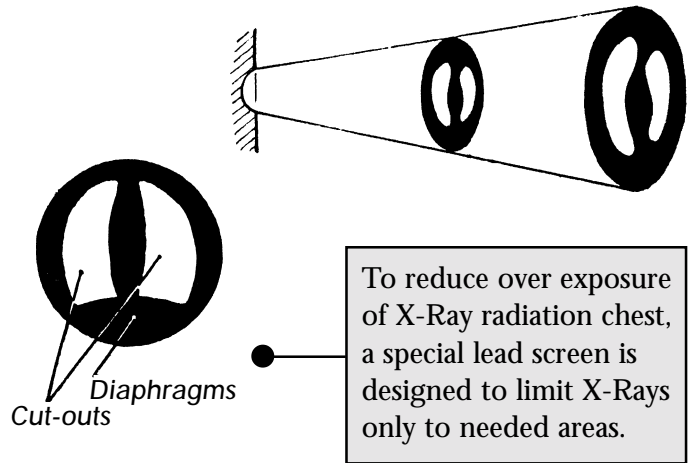
Instead of lifting many high intensity lights by balloons, only one reflector is lifted. The lights are installed on the ground and beamed toward the reflector.

B. Extract only the necessary part or property from an object.

Mine rescue teams wore bulky cooling containers in their backpacks. Now, cooling systems are stored in separate containers that can be placed on the floor.



“Doctor, I have a pain in the lower tooth on the left.”

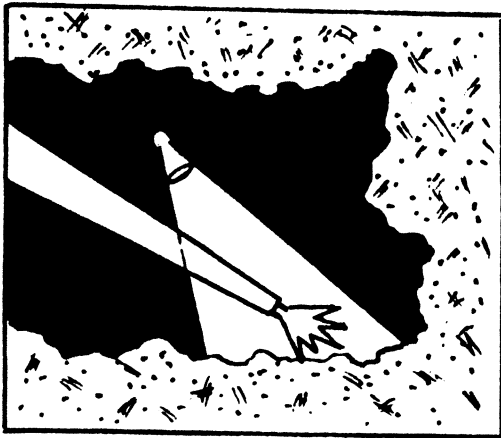
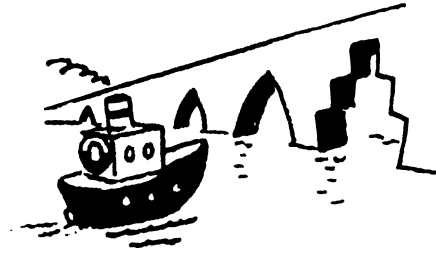


To reduce over exposure of X-Ray radiation chest, a special lead screen is designed to limit X-Rays only to needed areas.



Local Quality

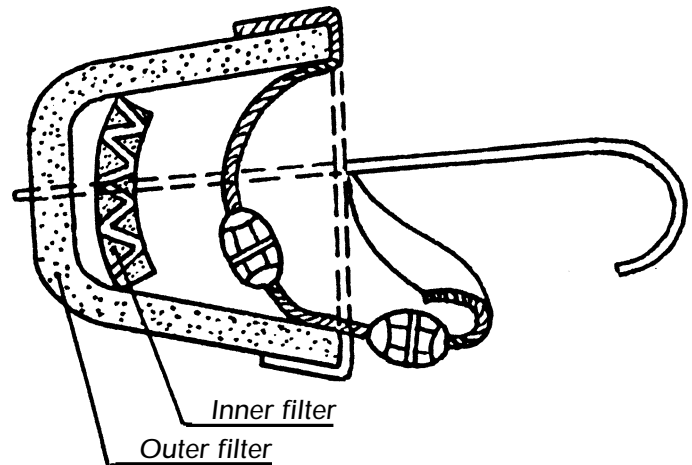
- A. Transition from homogeneous to heterogeneous structure of an object or outside environment (action).



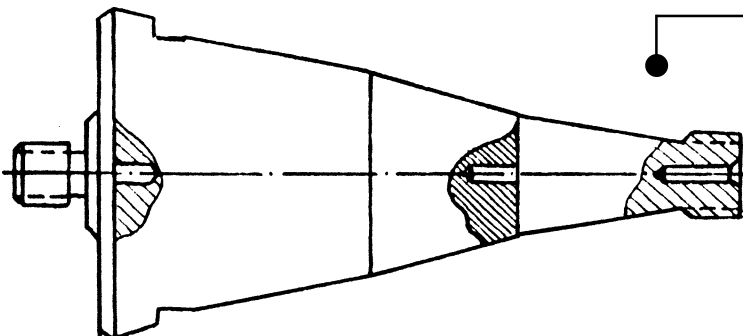
In order to combat dust in coal mines, a cone shaped mist of water is sprayed over the working parts of drilling and loading machinery. The smaller the droplets, the greater the effect in combating dust. However, the fine mist hinders work. Solution: Spray a layer of *coarse* mist around the cone of *fine* mist.

- B. Different parts of an object should carry out different functions.

A dust filter is made with porous membranes. The outer membrane has larger pores for preliminary filtration while the inner membrane has fine pores to collect small particulates.



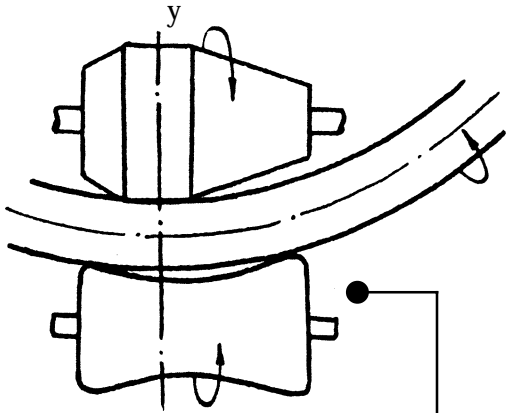
- C. Each part of an object should be placed in conditions that are most favorable for its operation.



To reduce the temperature in an ultrasonic device for making holes, the middle section is made from heat conductive material while outer parts are made from wear resistant material.

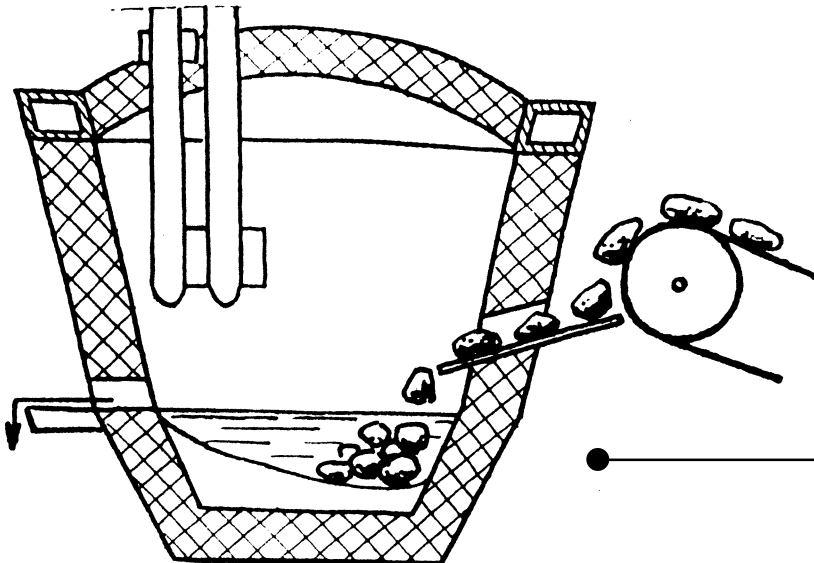
Asymmetry

- A. Replace symmetrical form(s) with asymmetrical form(s).

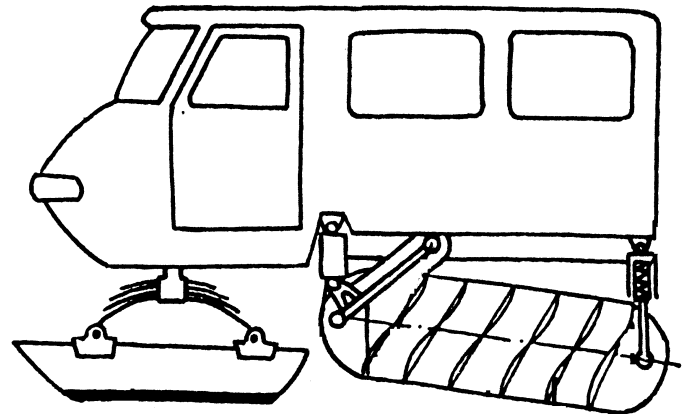
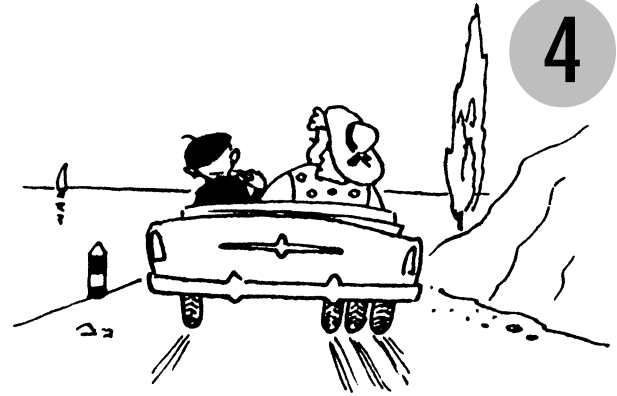


A device to straighten a wire consists of two rollers, convex and concave, made asymmetrical around the *y*-axis to speed production and increase quality.

- B. If an object is already asymmetrical, increase its degree of asymmetry.



An electrical furnace has electrodes asymetrically placed permitting the continuous loading of ore and the discharge of molten metal.

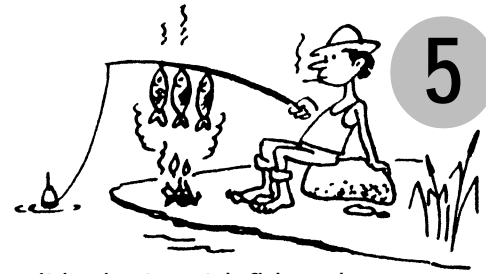


The driving drum of a snowmobile is positioned under the vehicle at an angle to better grip the snow.

Consolidation

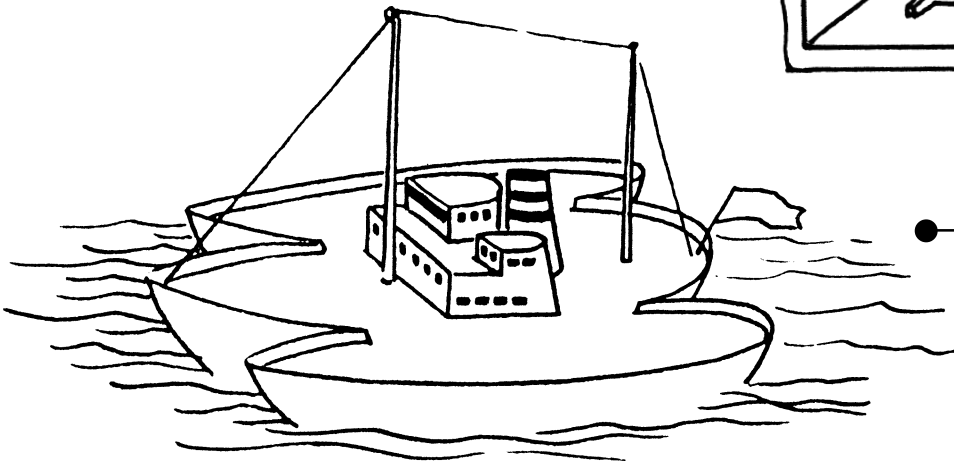
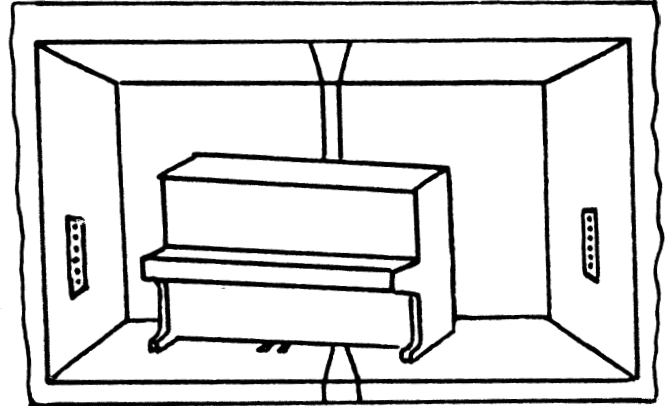
5

A. Consolidate in space homogeneous objects or objects destined for contiguous operations.



It is nice to catch fish and cook at the same time.

Two lifts are combined to carry a wide load. To accomplish this task the adjoining partitions are removed.



In a triple-hull ship the interference of waves between hulls reduces water friction.

B. Consolidate in time homogeneous or contiguous operations.

Nozzles installed at the rotor provide hot steam that thaws the frozen ground for easy excavation.

