Technical analysis exercises

1st year of the first cycle

Corrected version

Name: _____

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Centre de développement pédagogique

centre de développement pédagogique
pour la formation générale en science et technologie

Rules of diagramming

Complete the sentences using the words below:

proportion – elements – colour – links – view – simple lines - parts – symbols – forces - movement

1- Choosing the best view to represent the object.

2- Represent the object by simple lines.

3- Name the various parts of the object.

4- Use symbols to represent the operating principles.

5- Represent the forces using arrows.

6- Represent the links and the guidance.

7- Use colour to represent the various parts of the object.

8- Represent the movement of the parts using appropriate symbols.

9- Indicate the critical elements.

10- Retain a certain proportion between the various parts.

Principles study of the clothes pin

Global function of the object: Holds clothes, cloths, objects, etc. on a clothes line.

Analysis of the object

Observe the object and answer the following questions:

1- How are the clothes held by the pin?

The fabric is jammed between the clothesline and the forks of the clothes pin.

2- How many parts make up this object? Give the characteristics of the linkage?

A single part. There is no linkage.

3- What is the advantage of using wood in the fabrication of this object?

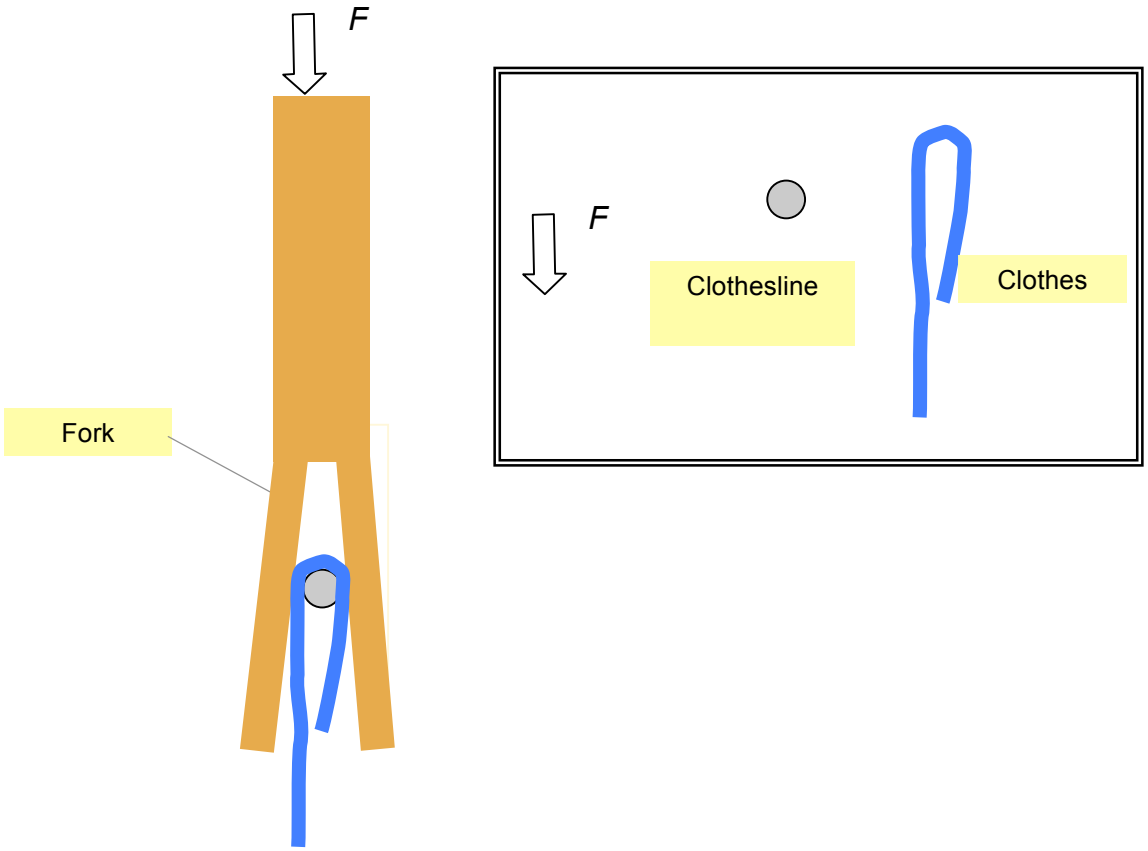
At the time that these kinds of clothes pins were used, wood was a plentiful, cheap resource. Few tools were necessary to make this object. Wood has a certain elasticity that allows the forks to spread.

4- Name another object that operates on the same principle.

A paper clip.

Complete the principles diagram of the clothes pin

1- Complete the principles diagram of the clothes pin using the elements in the inset.



PRINCIPLES DIAGRAM

Principles diagram of the pizza cutter

Global function of the object: Allows pizza or pastry to be easily cut.

Analysis of the object

Observe the object and answer the following questions:

1- What type of linkage is found between the handle and the rod?

Direct link, rigid, fixed and complete.

2- What type of linkage is found between the wheel and the rod?

Indirect link, rigid, fixed and partial.

3- Is there a simple machine in this object? If so, locate it on the object and give its use.
The wheel has a sharp cutting edge made up of two inclined planes.

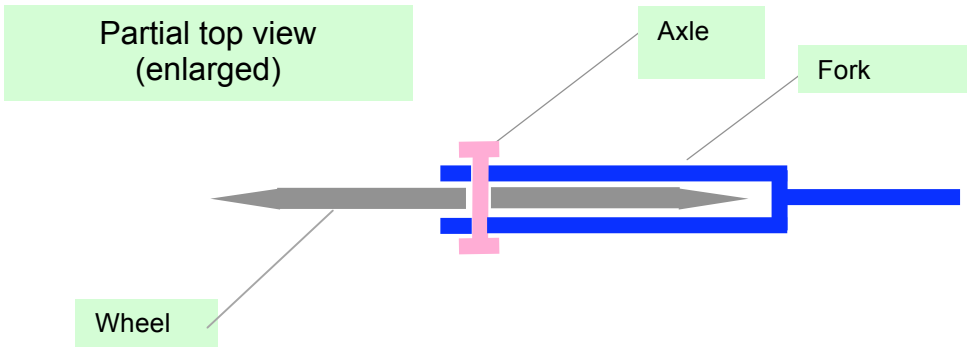
4- How is the wheel affixed to the rod?

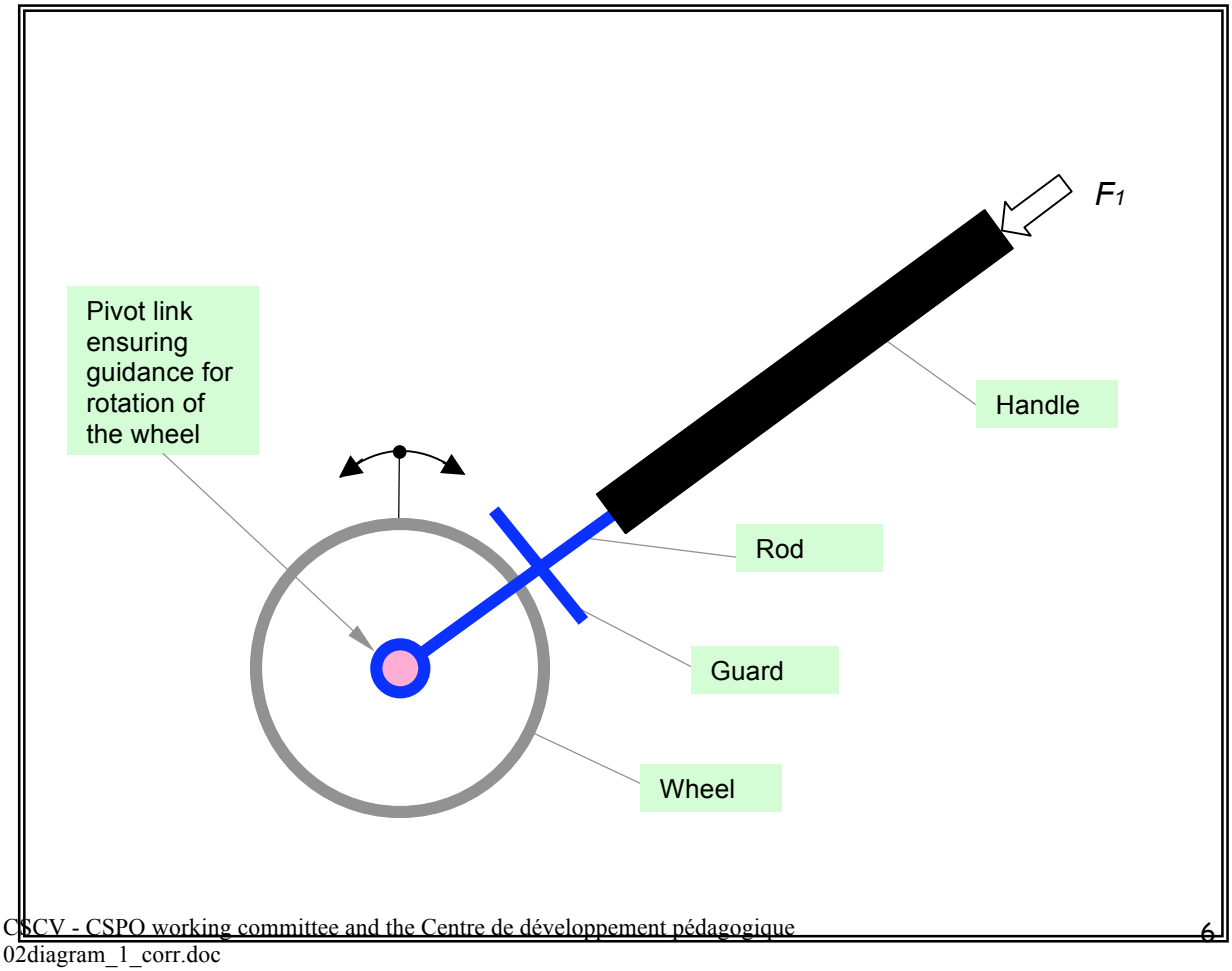
By a rivet.

5 - What materials are used in this object?
The wheel, the fork, the axle and the rod are made of aluminium. The handle is made out of plastic.

Complete the principles diagram of the pizza cutter

1- Complete the principles diagram of the side view.
2- Link the parts of the object to the elements on the diagram.





Principles study of the match box

Global function of the object: Safely holds matches, which can not be lit without being rubbed on the integrated abrasive lighting strip.

Analysis of the object

Observe the object and answer the following questions:

1- What type of movement does the drawer in the box carry out?

Translation.

2- What role does the abrasive strip on the side of the box perform?

Allows the matches to be lit by rubbing them along the strip.

3- What substances make up the abrasive strip?

Glass dust and red phosphorus.

4- What are the series of events that allow the match to light?

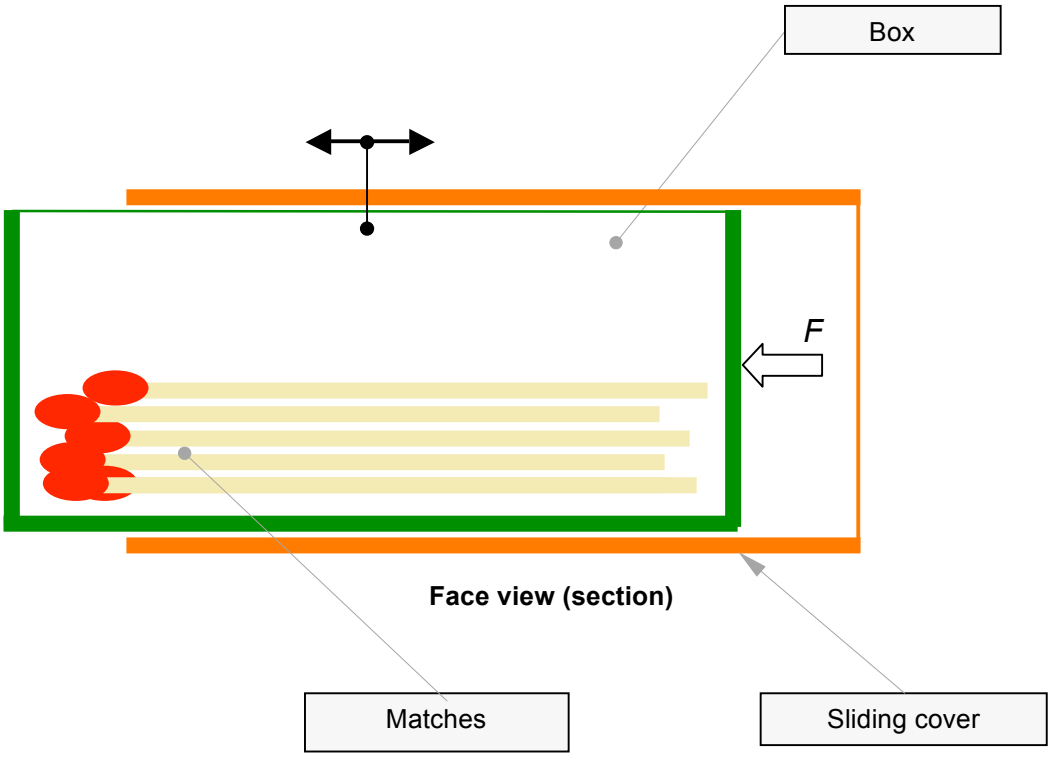
The heat from rubbing transforms the red phosphorus (the abrasive strip) into white phosphorus, which in turn lights the match.

5- What is this type of match called?

Safety match.

Complete the principles diagram of the match box

1- Complete the principles diagram of the match box using a face view. Draw the matches in the box.



PRINCIPLES DIAGRAM

Principles study of the binder clip

Global function of the object: Allows for several sheets of paper (or other items) to be clipped together and held with a single handed action.

Analysis of the object

Observe the object and answer the following questions:

1- What type of lever is found in this object? What part of the object constitutes the lever pivot?
The leaf spring and the arms make up a Class 1 lever.

2- What type of link is found between the flexed leaf spring and the binder clip arms?
Direct link, rigid, removable, partial.

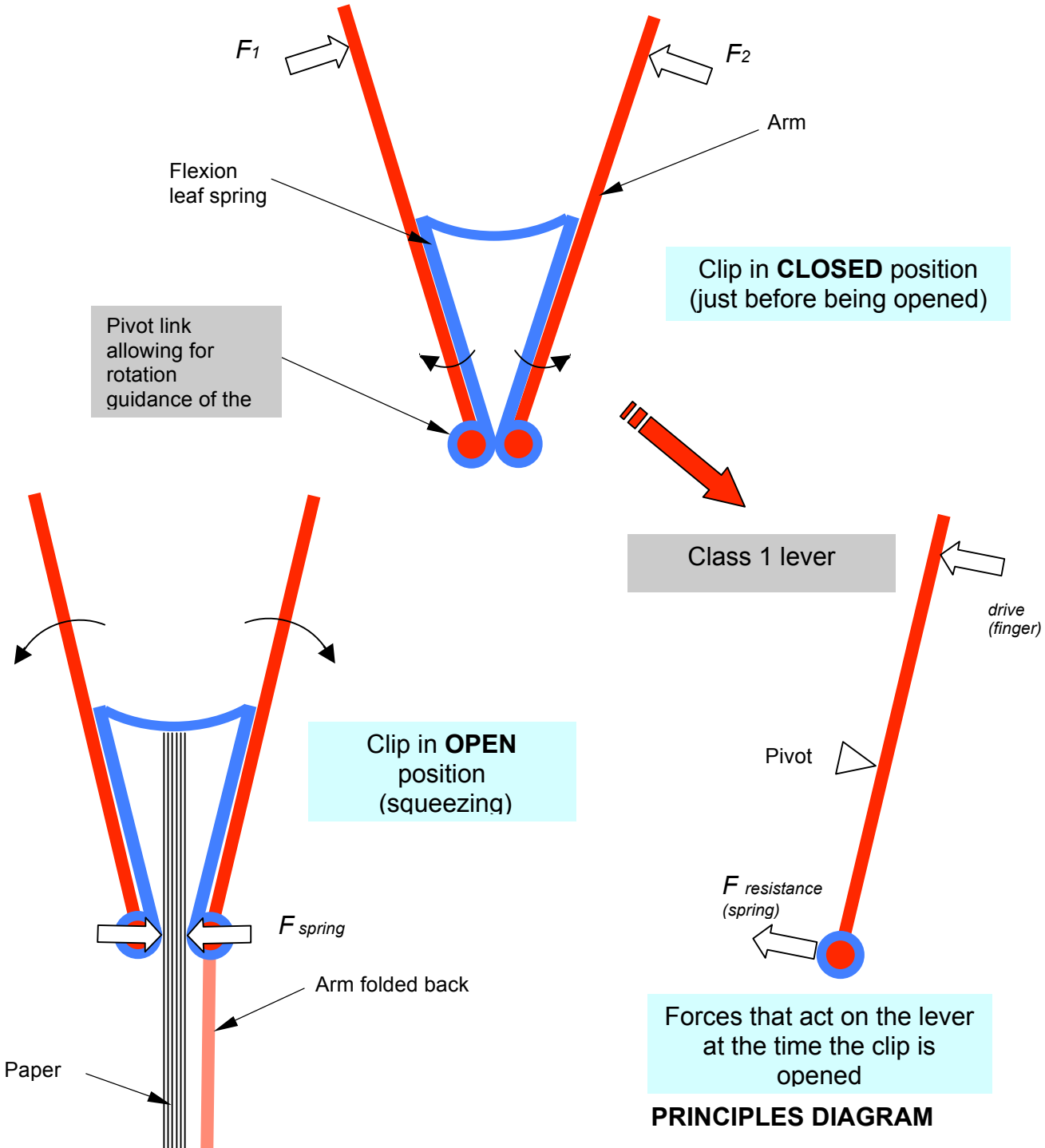
3 - Where must the driving force be applied for the clip to open?
The driving force is applied at the extremity of the arms.

4- Where is the resistance force applied when the clip holds papers?
The resistance force is at the pivot link between the leaf spring and arms.

5- What materials were used in the fabrication of the clip?
Aluminium.

Complete the principles diagram of the binder clip

1- Complete the principles diagram of the binder clip in the open position, namely when paper is being held.



PRINCIPLES DIAGRAM

Principles study of the correction tape applicator

Global function of the object: Allows for a rolled, self adhesive tape to be apposed manually onto a surface.

Analysis of the object

Observe the object and answer the following questions:

1- Which is the drive gear? The bigger gear.

2- How many teeth does the drive gear have? 47 teeth.

3- Which is the driven gear? The smaller gear.

4- How many teeth does the driven gear have? 28 teeth.

5 - Which of these gears turns fastest? Slowest?

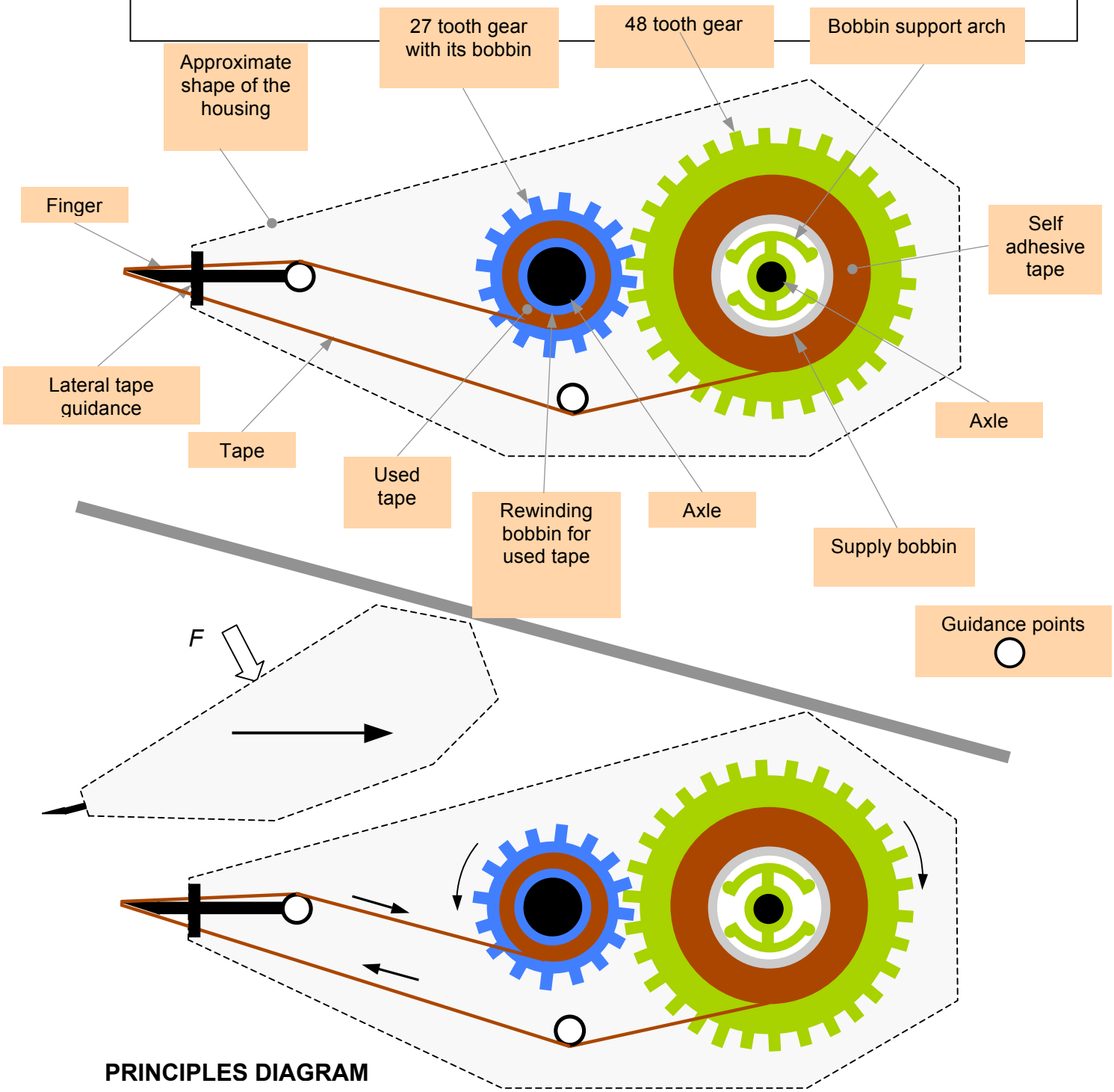
The bigger gear turns more slowly, the smaller one turns faster.

6- What is the advantage of using transparent plastic to make this object?
It allows you to see how much tape is remaining.

Complete the principles diagram of the correction tape applicator

1- Cut out the elements presented in Annex I, then glue them in such a way as to carry out the principles diagram of the applicator.

2- Connect the parts of the object to the elements on the diagram.



PRINCIPLES DIAGRAM

Principles study of the container with pressure lid

Global function of the object: Keeps the food from being exposed to the ambient air while remaining easy to open and close with your hands.

Analysis of the object

Observe the object and answer the following questions:

1- What is the use of the sealing joint on this container?

It prevents the food in the container from being exposed to the air.

2- Describe the link between the lid and the container.

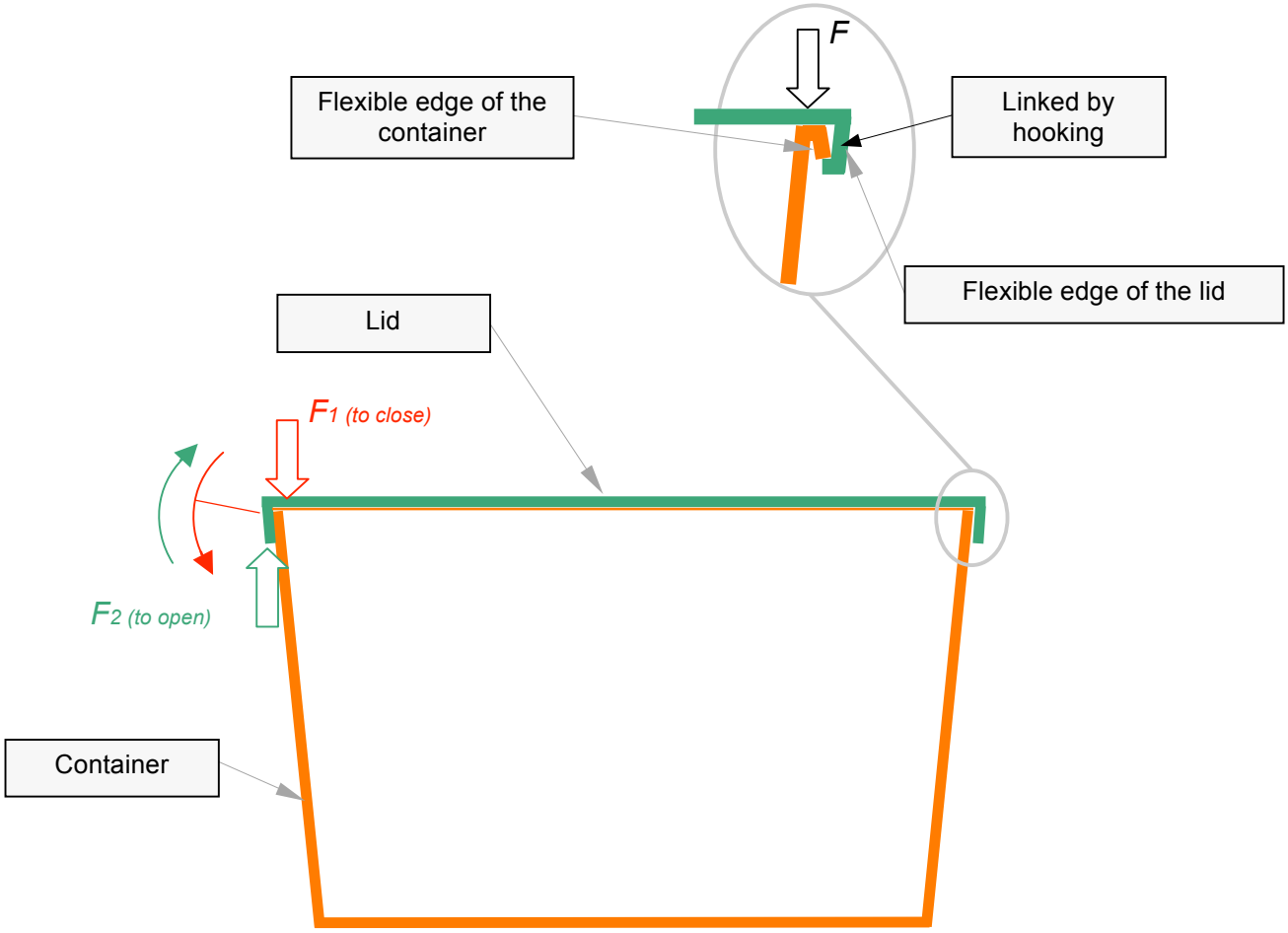
Direct link, elastic, removable, partial.

3- What material is used for this object?

Plastic

Complete the principles diagram of the container with pressure lid

1- Carry out the principles diagram.



PRINCIPLES DIAGRAM

Principles study of the «C» clamp

Global function of the object:

It allows objects to be clamped together.

Analysis of the object

Observe the object and answer the following questions:

1- What is the set formed by the nut and bolt called?

A nut-bolt system.

2- What do you call the movement carried out by the screw in the nut?

A helical movement.

3- Is there a simple machine in this object? If so, specify where it is located.

A Class 1 lever. It is located on the turning rod.

4- What type of joint is there on the mobile pressure plate?

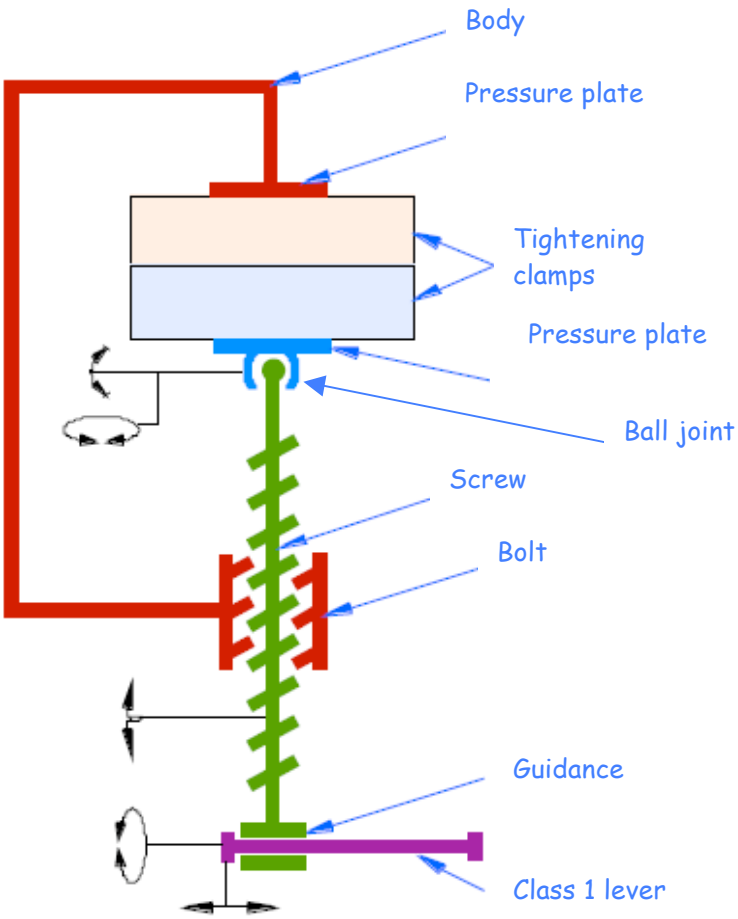
A ball joint.

5- Where are the resistance forces applied?

On the objects to be clamped and on the Class 1 lever.

Complete the principles diagram of the «C» clamp

1- Draw the nut-bolt system and the ball joint.



Principles study of the container with a flap lid

Global function of the object:

Supplies a way to keep food from being exposed to the ambient air; it is reusable many times and easy to open and close with your hands.

Analysis of the object

Observe the object and answer the following questions:

1- What is the type of link between the lid and the container?

Direct link, rigid, removable and complete.

2- What is the advantage in using this type of link in a plastic container?

The presence of the flaps means the container has a better seal.

3- What is the advantage in using plastic as a material for this type of container?

Plastic containers are inexpensive to produce and this allow for the production of containers of many different shapes and sizes. They are recyclable.

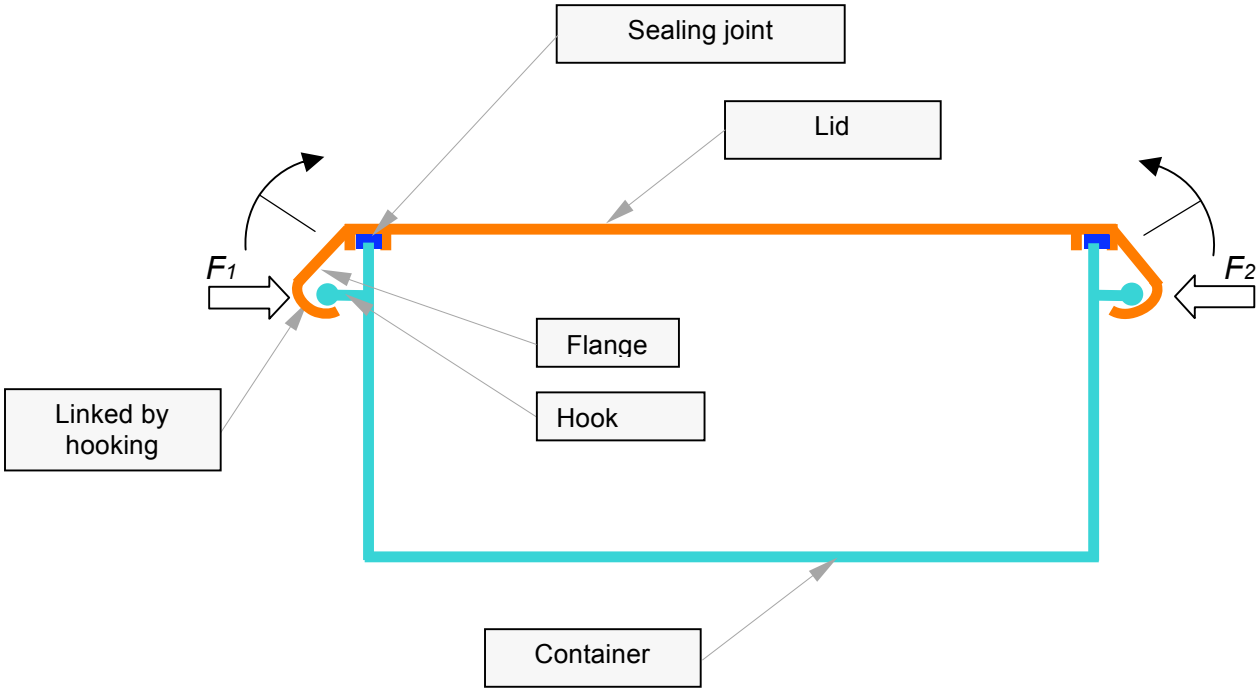
4- What is the use of the sealing joint in this plastic container?

Gives the container a better seal.

Complete the principles diagram of the container with a flap lid

1- Draw the flanges of the object.

2- Connect the parts of the object to the elements on the diagram.



PRINCIPLES DIAGRAM

COMPONENTS OF THE APPLICATOR