

**LINKING IN TECHNICAL OBJECTS (pp. 427–430)**

1. Look at the bicycle opposite.

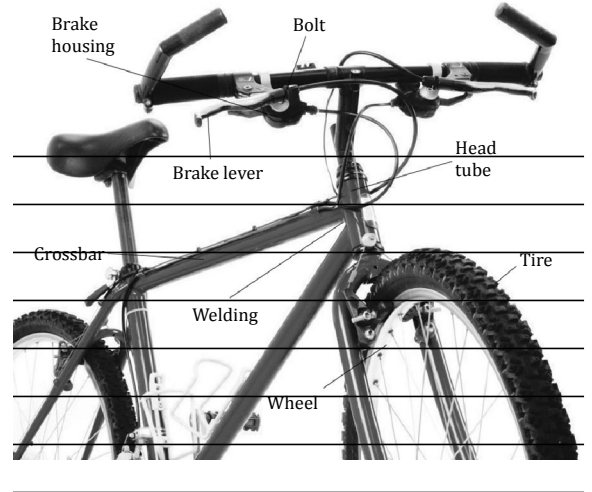
a) Name the four characteristics of the link between the tires and their respective wheels. Explain each characteristic.

*Direct, because there is no linking component between the two parts.*

*Flexible, because the surface of the tire can be deformed.*

*Removable, because it is possible to separate the two parts without damaging them.*

*Complete, because it prevents the independent motion of one of the two parts.*



b) Name the four characteristics of the link between the brake housing and lever. Explain each characteristic.

*Indirect, because there is a linking component between the two parts (the bolt).*

*Rigid, because the surfaces of the two parts cannot be deformed.*

*Removable, because it is possible to separate the two parts without damaging them.*

*Partial, because the brake lever can move independently.*

c) Name the characteristics of the link between the crossbar and the head tube. Explain each characteristic.

*Indirect, because there is a linking component between the two parts (the welding).*

*Rigid, because the surfaces of the two parts cannot be deformed.*

*Non-removable, because it is impossible to separate the two parts without damaging them.*

*Complete, because it prevents the independent motion of one of the two parts.*

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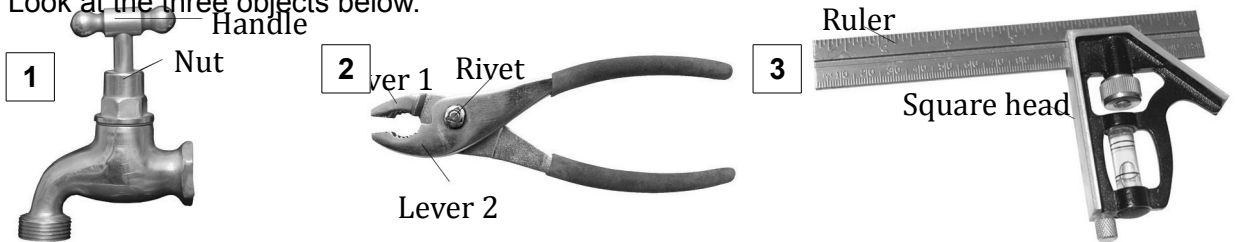
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**GUIDING CONTROLS (pp. 431–435)**

2. Look at the three objects below.



a) For each of the three objects, name the type of guiding involved.

*Faucet: helical guiding*

*Pliers: rotational guiding*

*Combination square: translational guiding*

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b) Identify the guiding component in each object.

*Faucet: a nut (the threads on the inside)*

*Pliers: a rivet*

*Combination square: a ruler (specifically the grooved section)*

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**MOTION TRANSMISSION SYSTEMS (pp. 435–445)**

3. The motion transmission system opposite is used to direct the chute of a snow blower.



a) What is this type of motion transmission system called?

*A worm and worm gear system*

b) Name the driver component in this system. What colour is it in the illustration? (See the colour illustration in the student book, p. 451.)



*The driver component is the worm (screw), which is red in the illustration.*

c) \_\_\_\_\_ on?  
(See the colour illustration in the student book, p. 451.)

*The driven component is the worm gear, which is blue in the illustration.*

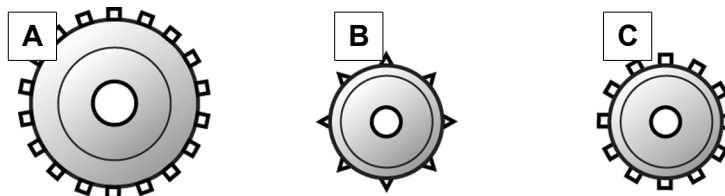
d) Does the system contain an intermediate component? If so, what is it called?

*This system does not contain an intermediate component.*

e) If the snow blower user decides to turn the chute manually, the motion transmission system could be damaged. Explain your answer.

*If force is applied to the chute to direct it, the worm gear will be forced to act as the driver of the motion transmission system. However, the driver of a worm and worm gear system is always the worm, and this type of system is irreversible. Trying to force it to reverse could therefore break it.*

4. Antonia is asked to build a gear train using two of the gears illustrated below.



a) Which gears should she choose for her system?

*Gears A and C*

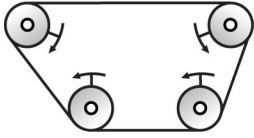
b) Which characteristic of the gears would motivate her choice?

*The shape of the teeth*

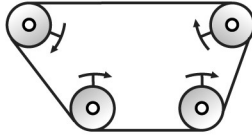


5. Among the motion transmission systems below, identify those whose rotational motions are correctly illustrated.

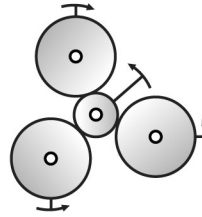
a)



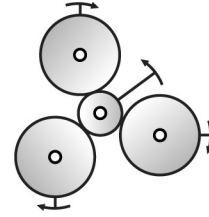
b)



c)



d)



*Systems b) and d)*

6. Look at the mechanism opposite.

a) Which type of motion transmission system is used in this technical object?

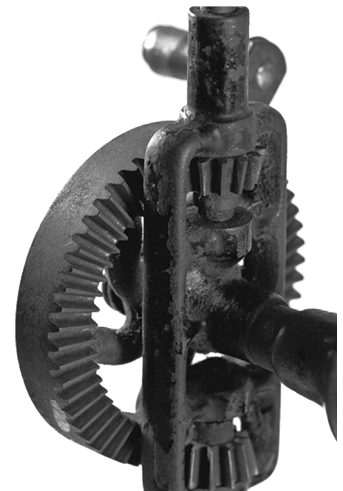
*A gear train*

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b) Which type of gear is used in this system?

*Bevel gears*

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Ignore # 7 as the images are not visible

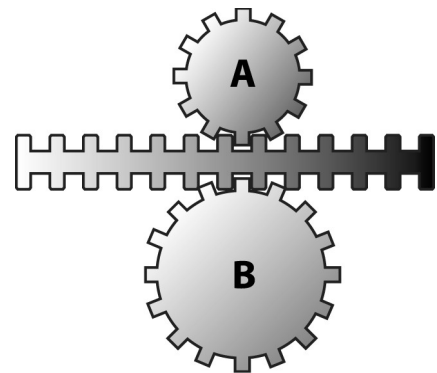
8. Look at the motion transformation system opposite.

a) What is this type of motion transformation system

*A rack and pinion system*

b) Which of the two gears will turn faster? Explain your answer.

*Gear A will turn faster because it has fewer teeth.*

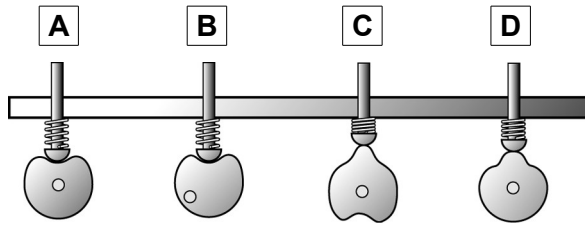


9. A tensioner is used to tighten the wire or rope of a clothesline, as in the illustration opposite. Which type of motion transformation system is at work here?

*A screw gear system*



10. Look at the motion transformation systems below.



a) What are these motion transformation systems called?

*Cam and follower systems*

b) What does the spring do in these systems?

*It ensures the constant pressure of the follower on the surface of the cam or the eccentric.*

c) In which of the four systems will the rod rise the highest?

*In system B*

## REVIEW QUESTIONS

A. Look at the bottle of correction fluid opposite.

a) Name the characteristics of the link between the cap and the brush stem.

*Direct, rigid, non-removable and complete*

b) Name the characteristics of the link between the cap and the bottle.

*Direct, rigid, removable and partial*

c) Which part acts as a guiding control in this object?

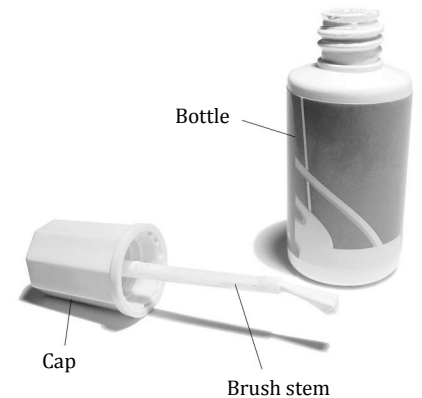
*The bottle (more specifically, the mouth of the bottle)*

d) Which type of guiding is involved?

*Helical guiding*

e) What characteristic of the guiding component controls the guiding?

*Its threads*



**B.** Glue sticks are among the most popular types of glue. In the tube, the glue stick is attached to a nut. Twisting the screw at the base of the tube will make the glue stick move up or down.

- a) What is the usual mechanical function of glue in technical objects?

*Linking*

- b) Which part guides the glue stick motion, and which type of guiding is involved?

*The tube acts as the guiding component. It guides the glue stick in a translational motion.*

- c) Is the system for raising or lowering the glue stick a motion transmission system or a motion transformation system? Identify the type of system at work.

*It is a motion transformation system—specifically, a screw gear system.*

- d) Name the four characteristics of the link between the cap and the tube.

*Direct, rigid, removable and partial*

