Name: _____ Group: _____ Date: _____

ENGINEERING

STUDENT BOOK	Ch. 12, pp. 383–388

Linking, typical functions of mechanical parts

1. Use the following words to complete the sentences below. Terms may be used more than once.

assembly	functioning	guiding	linking	mechanical
technical objects	component	part	parts	

a) _____ are often composed of many _____ assembled to function together.

b) A _____ is a _____ or a fluid that has a specific _____ function in a technical object.

c) A basic _____ function is the role played by a component or group of components in the _____ and the _____ of a technical object. _____ and _____ are also part of this type of function.

d) A component that controls the motion of one or more moving parts in a technical object performs a _____ function, while a component that connects parts of a technical object performs a _____ function.

2. Indicate if a translational guide or a rotational guide ensures functioning of the following objects.

	Translational guide	Rotational guide
a) Desk drawer that slides	☐	☐
b) Hip joint in motion	☐	☐
c) Roll that unrolls paper towels	☐	☐
d) Double-hung window that moves up and down	☐	☐
e) Hair clip that opens	☐	☐
f) Zipper that opens	☐	☐

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Linking, typical functions of mechanical parts (*continued*)

3. Observe the technical object illustrated.

a) What type of link exists between the screen and the keyboard?

_____

b) For each pair of characteristics of this link, circle the one that applies and explain your choice.

Pair of characteristics	Explanation
1. Direct or indirect	_____
2. Rigid or flexible	_____
3. Removable or non-removable	_____
4. Complete or partial	_____

4. Match each technical object to the type of link that exists between its parts.

Technical object	Type of link
a) Manual air pump	1. Fixed
b) Set of plastic blocks	2. Rotating
c) Scissors	3. Sliding
d) Container of mayonnaise and cover	4. Sliding rotating
e) Pen with retractable point	5. Spherical
f) Joystick	6. Helical

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ENGINEERING (*continued*)

STUDENT BOOK	Ch. 12, pp. 389–398

Function, components and use of motion transmission systems, speed changes (AST)

1. Circle the incorrect statement about complex mechanical functions.

a) When several components share the same function, they form a system.

b) All systems contain a driver, a driven component and an intermediate part.

c) A complex mechanical function is the role played by a set of components in transferring motion inside a technical object.

d) The transmission and transformation of motion are the main complex mechanical functions.

2. Indicate if the objects below feature a system of motion transmission or motion transformation.

	Transmission of motion	Transformation of motion
a) Crankset of a bicycle	☐	☐
b) Tuning key of a guitar	☐	☐
c) Sewing machine	☐	☐
d) Car jack	☐	☐
e) Salad spinner	☐	☐

3. Match each of the following systems of motion transmission to the corresponding function below. More than one system may have the same function.

A. Friction gear
B. Simple gear
C. Pulley and belt
D. Chain and sprocket
E. Worm and worm gear

Function	System
a) Transmit rotational motion to non-parallel parts that are close together.	_____
b) Transmit rotational motion between two or more parts that are close together.	_____
c) Transmit motion between parts that are relatively far apart from each other.	_____

Name: _____ Group: _____ Date: _____

Function, components and use of motion transmission systems, speed changes (AST) (*continued*)

4. True or false?

a) Only motion transmission systems contain one or more sprockets. _____

b) Friction gear systems and pulley-and-belt systems contain wheels with no teeth. _____

c) Screws are contained in worm and worm-gear systems and screw gear systems. _____

d) The gear in rack-and-pinion systems is called a pinion and can be found in a car's steering system. _____

5. Complete the following sentences that refer to the variation of motion speed during its transmission to motion transmission systems.

a) In a friction gear system or a pulley-and-belt system, rotational speed depends on

_____

b) In a gear train system or a chain-and-sprocket system, rotational speed depends on

_____

c) In worm and worm-gear systems, rotational speed depends on

_____

6. Match each technical object to the type of link that exists between its parts.

Example	System
a) In a sewing machine	1. Rack-and-pinion system
b) Pump	2. Cam-and-follower system
c) Cable tensioner	3. Slider-crank system
d) Adjustment of certain microscopes	4. Screw gear system

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ENGINEERING (*continued*)

Electricity (AST)

STUDENT BOOK	Ch. 12, pp. 399–405

1. Use the following symbols to indicate if the definitions below apply to:

◯ electric current
□ direct current
△ alternating current

a) Current in which electrons always flow in the same direction.

b) The orderly flow of negative charges carried by electrons of atoms

c) Disorderly flow of free electrons

d) Current in which electrons flow in a back-and-forth motion.

2. Indicate if the following objects make use of direct current (DC) or alternating current (AC).

a) Toaster plugged into a receptacle _____

b) Flashlight with two D-type batteries _____

c) Boat battery _____

d) Living-room lamp _____

3. Match each electrical function to an electrical component.

Electrical function	Electrical component
a) Power supply	1. Wire sheathing
b) Conduction	2. Refrigerator
c) Insulation	3. Circuit breaker
d) Transformation of energy	4. Receptacle
e) Control	5. Dimmer switch
f) Protection	6. Electrical wire

4. Several types of components can be used to open and close an electrical circuit. Circle the one that does not apply.

a) Push-button switch
b) Photoelectric cell
c) Dimmer switch
d) Ceramic insulator
e) Rocker switch

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ENGINEERING (*continued*)

STUDENT BOOK	Ch. 12, pp. 405–407

Manufacturing process (AST)

1. Match each action below to a step of the manufacturing process.

A. Measuring and marking parts
B. Machining parts
C. Assembling and finishing parts

a) Drilling _____
b) Gluing _____
c) Measuring _____
d) Marking _____
e) Welding _____
f) Rolling _____
g) Moulding _____
h) Varnishing _____

2. Name a technique used to carry out each action in the manufacturing of a technical object.

Action	Technique
a) Identifying reference points contained in engineering drawings	_____
b) Marking reference points	_____
c) Giving a shape to an object with a mould	_____
d) Correcting defects on certain parts with a planer	_____
e) Finishing an object with a sander	_____

3. Name four machining techniques.

_____ _____
_____ _____

4. Name three techniques used to modify parts that need adjustment before assembly.

_____ _____ _____