Name: _____ Group: _____ Date: _____

MATERIALS

STUDENT BOOK	Ch. 12, pp. 368–373

Constraints (tension, compression, torsion), mechanical properties

1. Match each term to its corresponding example.

Term	Example
a) Material	1. Metal screwdriver
b) Raw material	2. Aluminum foil
c) Equipment	3. Iron ore

2. Use the following terms to complete the text below.

consequences	constraint	mechanical constraint	deformations
elastic	intensity	material	rupture

A _____ is the effect that en external force produces on a _____. Subjecting materials to a _____ results in _____ called _____, which can be _____ or permanent. When the _____ of a constraint is too great for a material, it can _____.

3. Match each type of mechanical constraint to an example.

A. Compression	C. Torsion	E. Shearing
B. Tension	D. Bending	

a) Curving a wood strip _____

b) Crushing a car to recycle the metal _____

c) Cutting a piece of paper into squares _____

d) Stretching an elastic to tie your hair _____

e) Twisting a sweater to remove excess water _____

Name: _____ Group: _____ Date: _____

Constraints (tension, compression, torsion), mechanical properties (*continued*)

4. Circle the statement that is false.

a) When there is elastic deformation, the material regains its shape once the constraint is removed.

b) A constraint that causes a permanent deformation is more intense than a constraint that causes a rupture.

c) Bending sheet metal results in permanent deformation.

d) A board that bends when walked on then regains its shape has undergone an elastic deformation.

e) If a crane lifts an overly heavy load, the cable could rupture if tension is too intense.

5. Identify the mechanical property referred to by each statement.

a) Thanks to this property, it is difficult to drill holes in certain metals.

_____

b) I help materials to regain their shape after being bent.

_____

c) I provide materials with physical impact resistance.

_____

d) I help materials to react with elastic deformation when subjected to tension.

_____

e) Thanks to this property, a material stretches without rupturing.

_____

f) I help materials to become flattened into sheets without breaking.

_____

Name: _____ Group: _____ Date: _____

MATERIALS (*continued*)

STUDENT BOOK	Ch. 12, pp. 373–383

Types and properties of materials: wood and modified wood, ferrous alloys, non-ferrous metals and alloys, plastics (AST)

1. Circle A or B to complete the following sentences on types of materials.

a) Hardwood is wood that comes from:
A. a species of deciduous tree such as maple, birch and oak.
B. trees with good resistance to disease.

b) Softwood is wood that comes from:
A. trees with less physical impact resistance.
B. a species of coniferous tree such as spruce, pine and cedar.

c) Modified wood is made from:
A. wood treated or mixed with substances such as glue or copper.
B. large trees.

d) Metals are extracted from:
A. sedimentary rock.
B. ores.

e) Ferrous alloys are:
A. a mix of metals of which the main constituent is iron.
B. a mix of metals of various types, including iron.

f) Non-ferrous alloys are:
A. a mix of metals of which the main constituent is a metal other than iron.
B. a mix of metals that contain no iron.

g) Plastics come mainly from:
A. the transformation of various substances.
B. petroleum and natural gas.

2. True or false?

a) Most types of wood have good elasticity. _____

b) Rot decreases the hardness of wood. _____

c) Wood is very ductile and conducts electricity. _____

d) Modified wood is used to manufacture larger materials than It is possible to produce with hardwood and softwood. _____

e) The mechanical properties of wood are more stable than the properties of modified wood. _____

Name: _____ Group: _____ Date: _____

Types and properties of materials: wood and modified wood, ferrous alloys, non-ferrous metals and alloys, plastics (AST) (*continued*)

3. Indicate if the following examples refer to wood or modified wood. For wood, indicate if it is hardwood or softwood; for modified wood, indicate if it is treated wood, laminated wood, plywood, particleboard or fibreboard.

	Wood	Modified wood	Type of wood or modified
a) Light-coloured material used to make decorative trim	☐	☐	_____
b) Material made of wood fibres and used to make floating flooring	☐	☐	_____
c) Material used to make building structures and snowshoes	☐	☐	_____
d) Light-coloured material used to make paper pulp	☐	☐	_____
e) Light- to pink-brown material used to make kitchen cabinetry	☐	☐	_____
f) Material used to make exterior structures such as decks	☐	☐	_____

4. Match each material to the appropriate type of metal or alloy.

Material	Metal or alloy
a) Pewter b) Steel c) Brass d) Cast iron e) Aluminium f) Bronze	1. Metal 2. Ferrous alloy 3. Non-ferrous alloy

Name: _____ Group: _____ Date: _____

Types and properties of materials: wood and modified wood, ferrous alloys, non-ferrous metals and alloys, plastics (AST) (*continued*)

5. Identify which of the following properties is referred to in each statement below.

Electrical conductivity	Flammability	Lightness (weight)	Corrosion resistance

a) Certain metals can be used to make fireworks.

_____

b) Certain non-ferrous metals or alloys can be used in electrical components.

_____

c) Certain metals retain their colour despite exposure to oxygen.

_____

d) Certain metals are used to make cans.

_____

6. Use the following terms to complete the sentences below.

heated	colour	cooled	lightness	moulded
polymers	recycling	recycled	resistance	thermoplastics

a) Plastics, materials made with _____, are available in a wide variety. The majority of plastics produced are _____. They soften when _____ and harden when _____.

b) As these plastics can be easily _____, they are used to manufacture a variety of objects. Several types can be _____ and are identified with a _____ code.

c) The properties of these plastics include: impact- _____, flexibility, impermeability, _____ and multiple _____ possibilities.

7. Match the type of plastic to its corresponding application.

Type of plastic	Application
a) PVC	1. Plastic dinnerware
b) Polyethylene	2. Transparent bowls
c) Polystyrene	3. Patio furniture
d) Acrylic	4. Grocery bags