

Properties of Matter

Complete the following texts:

1. Changes of state / form

Clue: Below boiling except fluids highly liquid solid state

0°C - **melting point** of ice. 100°C - _____ **point** of water.

Ice is _____, water is _____, steam is gaseous. Steam and water are _____.

Steam, water, ice, oxygen, neon: all these are fluids _____ ice. Sometimes the properties of a substance change when it changes its _____. For example, if the temperature of oxygen falls _____ -183°C, it changes from a colorless gas to a bluish liquid, which is _____ magnetic.

2. A substance may be an element, a compound or a mixture.

Clue: dissolve element form gas hard properties salt salty substance

An element, such as copper or iron cannot be broken down into simpler substances. When elements combine to form compounds, there is a chemical reaction. Some _____ of the elements change during the reaction. For example, the _____ chlorine (Cl) is a poisonous yellow _____. Sodium, on the other _____, is a soft silvery-white metal which reacts violently with water. However, if these elements combine, they _____ sodium chloride, or _____. This is a harmless white _____.

A mixture of a sand and salt is yellowish-white and it tastes both _____ and gritty. If we put the mixture in water, the salt will **dissolve**, because it is **soluble**, but the sand will not _____, because it is **insoluble**.

3. Properties of matter

A breakable material is **brittle**, or **fragile**; but if it does not break easily, it is **tough** [a].

A **hard** material is difficult to scratch, whereas a **soft** material is easy to scratch.

A **flexible** material bends easily, e.g. rubber, while a **rigid** material does not bend easily.

Some materials produce little friction when they are rubbed - they have **smooth** surface.

Some materials have a **rough** [a] surface and produce a lot of friction; e.g. sandpaper.

The sea is calm or rough.

You can see through [θru:] **transparent**, materials such as water. You cannot see through **translucent** materials, such as dirty water, but light passes through them.

You cannot see through **opaque** [əu'peik] glass or other materials and the light cannot pass through them.

Combustible materials, such as wood burn easily. If gasses burn easily, they are [in'flæməbl]

(in)flammable. Some people also have an inflammable temper. Phosphorus is **self-ignitable** in the light.

4. Word formation: Form the nouns.

Hard _____, soft _____, rigid _____, flexible - flexib _____, dissolve - sol _____,

Combust _____ / combust _____, (in)flame - inflamm _____ / inflamm _____,

ignite - ignit _____ / ignit _____.

5. Answer these questions:

1. What is the boiling point of oxygen?

2. Are sodium and chlorine harmless?

3. What is the difference between a compound and a mixture?

Adapted from Bates, Martin and Dudley-Evans, Tony: *Nucleus of General Science*. Longman 1990. Věra Hranáčová, 2011

6. Discuss these questions:

- a) What is your favourite material for clothing? Do you prefer natural or synthetic materials? Why? What material are you wearing right now?
- b) Do you know some modern hi-tech materials? (e.g. Gore-tex)? Which ones? Where are they used? What are their **advantages** over traditional materials?
- c) Give examples of things which were originally **made of** natural materials and now are made of plastics. Why are plastics now used? Are there any **disadvantages**?
- c) What materials can you see in this classroom? What objects are **made of** them?
- d) What material is your watch / pen / book / shoes / computer / mobile phone / bottle **made of**?
- e) What are some traditional and modern building materials? Give examples.

7. Some other properties of materials. Form adjectives or nouns.

Czech translation	Noun	Adjective
a) pružnost	elasticity	elastic
b) křehkost (nepružnost)	brittleness	(rocks, bones, glass)
c) tažnost, kujnost	malleability, ductility	
d) plastičnost, tvárnost	ductility	
e) vodivost	conductivity	
f) žáruvzdornost	heat-resistance	
g) zápalnost, hořlavost	(in)flammability, combustibility	x!
h) zápalnost	ignitability [ig'naitə'biliti]	
i) jedovatost, toxicita		toxic
j) reaktivita	reactivity	
k) netečnost	inertness	
l) lehkost		light
m) těžkost	!	heavy
n) savost, absorpčnost	absorbency	
o) viskozita, lepkavost	viscosity	!
p) hustota	density	
q) trvanlivost, odolnost	durability	
r) odolnost proti korozi	corrosion resistance	
s) síla	!	strong
t) křehkost (ztráta síly)	fragility	(bones, glass)

8. Choose the right word in a sentence:

- a) A conductive / conductivity material can be used to conduct electricity.
- b) If a material is easy to stretch under stress, we call it elastic / elasticity.
- c) If you want to improve durable / durability of a machine, clean it regularly.
- d) Hard / hardness is an important property of steel.
- e) Concrete is used for building because of its strong / strength.

Adapted from A. Rozkošná- Bates, Martin and Dudley-Evans, Tony: *Nucleus of General Science*. Longman 1990.

HOMEWORK : Science and Technology: Fill in the gap with the correct word.

..... are being carried out to find a cure for cancer.
Experiences Experiments Trials Research

Microscopesvery small objects many times to make them visible.
magnify enlarge expand increase

Radio signals are now oftenby satellite.
received delivered transmitted dispersed

Computers are able to vast amounts of data very quickly.
process digest convert adapt

Solar power stations are able to the energy of the sun.
harm maximise drive harness

Other energy sources include wind and wave power.
renewable recyclable returnable reusable

In some types of power station steam is used toturbines.
force turn drive rotate

Mercury is aat room temperature
fluid liquid solid gas

Hydrogen and oxygen are the two that make up water.
compounds atoms molecules elements

Allis composed of atoms.
stuff material substance matter

The of lead is greater than that of aluminium.
rigidity weight density volume

When water is heated itmore quickly.
evaporates condenses melts solidifies

The of iron and oxygen produces rust.
reaction separation decomposition composition

Chemists study the composition of natural
substances machines mixtures alloys

The of water is 100°C.
melting point boiling point point of condensation freezing point

J.Harbord: *Topic-based Vocabulary*.