

## SPRINGS

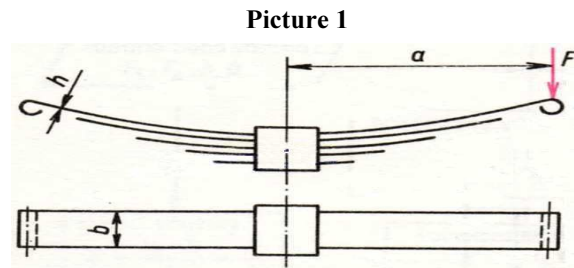
### 1. Introduction

**Springs** are mechanical *components*. They are put between two parts. They make a *spring connection* which is *detachable*. **Springs** accumulate energy. They catch and *reduce impacts*. We use *springs* for example for *means of transport*.

### 2. We can classify *springs* according to material, *shape* and *tension*:

#### 2.1 Metal springs stressed by *bending* can be for example:

- **Leaf springs** – They are steel *strips* or *packs of springs* (see Picture 1).

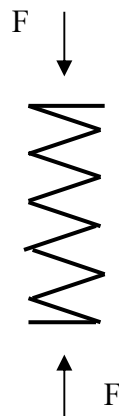


Pack of springs with its basic dimensions

#### 2.2 Metal springs stressed by *torsion* can be for example (see Picture 2):

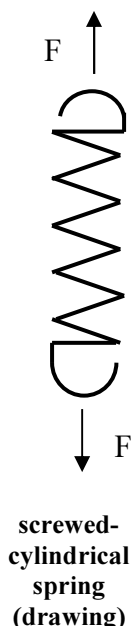
- **Screwed-cylindrical springs** – They are mostly in machines and equipment. They can be *drawing* or *compressed springs*.

Picture 2



screwed-  
cylindrical  
spring  
(compressed)

## INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ



**2.3 Non-metallic springs** can be:

- **Rubber springs**
- **Plastic springs**

**2.5 Special springs** can be:

- **Pneumatic springs**
- **Hydro-pneumatic springs**

### 3. Spring characteristics

The characteristic of a **spring** is important. It shows the **dependence** of **deformation** on **load**. The characteristic is linear, progressive or degressive.

For example:

- **Screwed springs** – They have a linear characteristic. It means that the **deformation** of these **springs** is directly **proportional** to **loading**.

## INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

**VOCABULARY**

<b>bending</b>	ohyb
<b>component</b>	součástka
<b>compressed</b>	tlačný
<b>connection</b>	spoj
<b>cylindrical</b>	válcový
<b>deformation</b>	deformace
<b>dependence</b>	závislost
<b>detachable</b>	rozebíratelný
<b>drawing</b>	tažný
<b>impact</b>	náraz
<b>leaf spring</b>	listová pružina
<b>load</b>	zatížení
<b>means of transport</b>	dopravní prostředky
<b>metal</b>	kovový
<b>non-metallic</b>	nekovový
<b>pack of springs</b>	svazek pružin
<b>proportional</b>	úměrný
<b>reduce</b>	tlumit
<b>rubber</b>	pryž
<b>screwed</b>	šroubovítý
<b>shape</b>	tvar
<b>stressed</b>	namáhaný
<b>strip</b>	pás
<b>tension</b>	namáhání
<b>torsion</b>	krut

**COMPREHENSION QUESTIONS**

1. What are springs?
2. Where are springs for example used?
3. What kinds of springs do you know?
4. What can a spring characteristic be?
5. What does a spring characteristic express?

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

## EXERCISES

### 1. Translate the verbs and add corresponding nouns:

#### VERBS

#### NOUNS

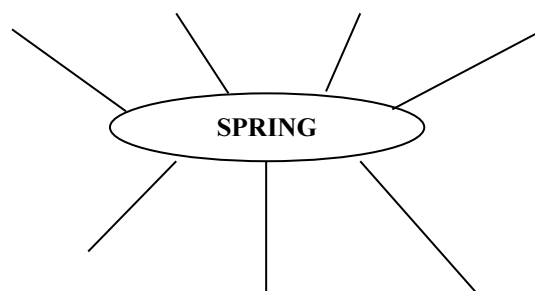
- 1 connect
- 2 compress
- 3 bend
- 4 draw
- 5 reduce
- 6 screw
- 7 classify
- 8 load

### 2. Read the definitions and supply the words from the text:

stress	rubber	shape	strip	metal	spring
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- 1 a type of solid mineral substance that is usually hard and shiny and that heat and electricity can travel through, for example tin, iron, and gold
- 2 a strong substance that can be stretched, used for making tyres, boots, etc.
- 3 a twisted piece of metal that can be pushed, pressed or pulled but which always returns to its original shape
- 4 the form of the outer edges or surfaces of sth
- 5 pressure put on sth that can damage it or make it lose its shape
- 6 a long narrow piece of paper, metal, fabric, etc.

### 3. What kind of spring have you learnt from the text:



## INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

### Key – for teachers only

#### 1.

	VERBS	NOUNS
1	connect <i>spojit</i>	<i>connection - spojení</i>
2	compress <i>stlačovat</i>	<i>compression - stlačení</i>
3	bend <i>ohýbat</i>	<i>bend, bending – ohyb, ohýbání</i>
4	draw <i>tahat, protahovat</i>	<i>draw, drawing – tah</i>
5	reduce <i>tlumit, snižovat</i>	<i>reduction- redukce, snížení</i>
6	screw <i>šroubovat</i>	<i>screw – šroub</i>
7	classify <i>třídít, klasifikovat</i>	<i>classification – třídění, rozdělení</i>
8	load <i>zatížit</i>	<i>load, loading – zatížení</i>

#### 2.

1	a type of solid mineral substance that is usually hard and shiny and that heat and electricity can travel through, for example tin, iron, and gold	<b>metal</b>
2	a strong substance that can be stretched, used for making tyres, boots, etc.	<b>rubber</b>
3	a twisted piece of metal that can be pushed, pressed or pulled but which always returns to its original shape	<b>spring</b>
4	the form of the outer edges or surfaces of sth	<b>shape</b>
5	pressure put on sth that can damage it or make it lose its shape	<b>stress</b>
6	a long narrow piece of paper, metal, fabric, etc.	<b>strip</b>

3. 7 kinds of springs – leaf spring, screwed-cylindrical spring (compressed), screwed-cylindrical spring (drawing), rubber spring, plastic spring, pneumatic spring, hydro-pneumatic spring