

ДЕПАРТАМЕНТ ОБРАЗОВАНИЯ И НАУКИ ТЮМЕНСКОЙ ОБЛАСТИ

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Практикум по английскому языку

для студентов, обучающихся по специальности

35.02.04 Технология комплексной переработки древесины

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Практикум содержит тексты для чтения на английском языке, охватывающие изучаемые студентами специальности 35.02.04 Технология комплексной переработки древесины на 1 курсе темы, и упражнения по каждому из текстов.

Упражнения делятся на лексические, и речевые.

Материалы составлены в соответствии с ФГОС СПО по специальности 35.02.04 Технология комплексной переработки древесины с учетом особенностей обучения в ГАПОУ ТО «ТКПСТ».

Адресовано студентам и преподавателям техникумов и колледжей технического профиля.

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Введение

Умение работать с литературой по специальности следует рассматривать как базовое при осуществлении любой профессиональной деятельности.

В данной методической разработке представлены разнообразные тексты и система упражнений по развитию у студентов навыков основных видов чтения: изучающего, ознакомительного, просмотрового и поискового.

Целевая установка каждого вида чтения определяет направленность учебных заданий. Так, учебные задания к текстам для просмотрового чтения направлены на формирование умения ориентироваться в логико-смысловой структуре текста, а также использовать информацию текста в соответствии с определенными коммуникативными задачами.

Практикум построен на основе программы по специальности 35.02.04 Технология комплексной переработки древесины с учетом особенностей обучения в ГАПОУ ТО «ТКПСТ».

Пособие содержит технические и переработанные учебные тексты по специальности с выделенными обязательными для запоминания языковыми единицами.

После каждого текста предусмотрены задания, помогающие включить языковые единицы в активный словарь.

Включение профессионально– ориентированной лексики и развитие умения извлекать информацию из текстов по специальности позволяет достигнуть конечной цели обучения устной речи в неязыковых профессиональных образовательных организациях – научить будущих специалистов высказываться по темам специальности, предусмотренным действующей программой по иностранным языкам.

MY PROFESSION IS – A CARPENTER

A **carpenter** is someone who builds and repairs things made from wood. Humans have been building useful products out of **wood** for a very long time. Today those who make things like **furniture, utensils, decorative items, toys,** and musical instruments are known as **woodworkers**. Carpenters work on larger structures.

Carpenters make parts of buildings, such as **staircases, door frames, and rafters**. Their work may also include **installing kitchen cabinets, countertops, molding, and trim**.

Definition and Nature of the Work

Carpenters work throughout the **construction industry**. They are the largest group of the building trades workers. They **saw, shape, and fasten wood** to build houses and other buildings. They also build cabinets, doors, and other objects made of wood. They work on construction sites, inside buildings, in factories, and in small **woodworking shops**. Carpenters use both **power and hand tools**, such as **hammers, saws, drills, and chisels**. They fasten wood with **nails, screws, bolts, and glue**.

Carpentry work can be divided into two categories—**rough carpentry** and **finish carpentry**. Rough carpenters often work outdoors where they begin projects using unfinished wood and other building materials. They frame houses, build scaffolding, and make forms **to be filled with concrete**. Forms are used **to mold** concrete for bridges, highways, and **house foundations**. Finish carpenters include those who **cut and fit doors**, windows, and interior molding. They also build and install cabinets, **lay hardwood floors**, and **panel rooms**.

Some carpenters build sets for theaters and television studios. Others build **wharves and docks**. **Millworkers**, or carpenters who work in factories, make **prefabricated, or ready-made**, parts for buildings, such as **window frames**, cabinets, and partitions. These parts are shipped already assembled to the construction site. Other millworkers are employed by lumberyards, cutting lumber and building prefabricated structures such as walls, floors, and ceilings. Some carpenters specialize in cabinetmaking. Cabinetmakers custom design cabinets, counters, shelves, and other **fixtures for homes, stores,** and restaurants. A few cabinetmakers specialize in building fine furniture by hand. Some carpenters work with other materials **in addition to** wood. They apply drywall or pre-finished coverings such as vinyl to ceilings, walls, and partitions. Carpenters can also **specialize in** installing acoustical panels to soundproof rooms.

Most carpenters are employed by contractors and builders. Those who work in cities often specialize in one kind of carpentry, while carpenters working in **rural areas** may do many kinds of rough and finish work.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.

2. Составьте 10 предложений, используя максимальное количество новой лексики.

3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников.

4. Переведите:

- a) To be shipped already assembled
- b) To be employed by lumberyards
- c) To cut lumber
- d) To build prefabricated structures
- e) To build fine furniture by hand
- f) To apply drywall or pre-finished coverings
- g) To install acoustical panels to soundproof rooms
- h) To be employed by contractors and builders

5. Составьте план пересказа текста.

6. Перескажите текст.

WOODWORKING HISTORY

Along with stone, **clay** and animal parts, wood was one of the first materials worked by early humans. The **development** of civilization was closely tied to the development of increasingly greater degrees of skill in working these materials.

Among early finds of wooden tools are the worked sticks, some of the first examples of wooden hunting gear. Flint tools were used for carving. Since Neolithic times, carved wooden vessels are known.

Examples of Bronze Age **wood-carving** include tree trunks worked into coffins from northern Germany and Denmark and **wooden folding-chairs**. In Germany were founded fine examples of wooden animal statues from the Iron Age.

Ancient Egypt

There is **significant evidence** of **advanced** woodworking in Ancient Egypt. Woodworking is depicted in many extant ancient Egyptian **drawings**, and a considerable amount of ancient Egyptian furniture (such as stools, chairs, tables, beds, chests) has been preserved. **Tombs** represent a large collection of these artefacts and the inner **coffins** found in the tombs were also made of wood. The metal used by the Egyptians for woodworking tools was originally copper and eventually, after 2000 BC bronze as **ironworking** was unknown until much later.

Commonly used woodworking tools included **ax**, adze, **chisel**, **pull saw**, and **bow drill**. Mortise and tenon **joints** are attested from the earliest Predynastic period. These joints were strengthened using pegs, dowels and leather or cord lashings. Animal glue came to be used only in the New Kingdom period. Ancient Egyptians invented the art of veneering and used varnishes for finishing, though the composition of these varnishes is unknown. Although different native acacias were used, as was the wood from the local sycamore and tamarisk trees, **deforestation** in the Nile **valley** resulted in the need for the importation of wood,

notably **cedar**, but also Aleppo **pine**, **boxwood** and **oak**, starting from the Second Dynasty.

Ancient Rome

Woodworking was essential to the Romans. It provided, sometimes the only, material for buildings, transportation, tools, and household items. Wood also provided pipes, dye, **waterproofing materials**, and energy for heat. Although most examples of Roman woodworking have been lost, the literary record preserved much of the **contemporary knowledge**. Vitruvius dedicates an entire chapter of his De architectura to **timber**, preserving many details. Pliny dedicated six books of his Natural History to trees and woody plants which provides a **wealth of information** on trees and their uses.

Ancient China

The **progenitors** of Chinese woodworking are considered to be Lu Ban and his wife Lady Yun, from the Spring and Autumn Period. Lu Ban is said to have introduced the plane, chalk-line, and other tools to China. This book is filled largely with **descriptions of dimensions** for use in building various items such as flower pots, tables, altars, etc., and also contains extensive instructions concerning Feng Shui. It mentions almost nothing of the intricate **glue-less and nail-less joinery** for which Chinese furniture was so famous.

Modern Day

With the advances in modern technology and the demands of industry, woodwork as a field has changed. The development of **Computer Numeric Controlled (CNC) Machines**, for example, has made us able **to mass-produce and reproduce products**, faster, with less **waste**, and often more **complex in design** than ever before. CNC Routers can carve **complicated and highly detailed shapes** into flat stock, to create signs or art. **Rechargeable power tools** speed up creation of many projects and **require** much less body strength than in the past, when boring multiple **holes**, for example. Skilled fine woodworking, however, remains **a craft** pursued by many. There remains demand for **hand crafted work** such as furniture and arts, however with rate and **cost of production**, the cost for **consumers** is much higher.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.
2. Составьте 10 предложений, используя максимальное количество новой лексики.
3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников.
4. Переведите:
 - a) Considerable amount of ancient Egyptian furniture
 - b) to be depicted in
 - c) literary record
 - d) to preserve
 - e) Mortise and tenon joints
 - f) most examples of Roman woodworking have been lost

- g) the plane tools
 - h) to contain extensive instructions concerning Feng Shui
5. Составьте план пересказа текста.
6. Перескажите текст.

THE "OVER-THE-TOP" WORKSHOP

From the outside, Mike Walker's workshop looks like a well-appointed lakeside retreat. It **looks like** that on the inside too—except for all the **woodworking tools**.

Obsessed with organization

Nestled in the forest on a shore of Lake Chelan in central Washington State, Mike Walker's 1,670-square-foot workshop is the epitome of organization. From the **outset**, plenty of storage space and an efficient **workflow** dominated the planning. "I am obsessed with organization," Mike says, "and we spent a lot of time planning spaces **to accommodate** all of the tools and accessories."

About his shop

TYPE: Dedicated outbuilding above a three-car garage and maintenance room

SIZE: 36x39'4" plus 16x16' project design room (1,670 sq. ft. total)

CONSTRUCTION: **Wood frame** with 2x6 studs and R-30 insulation on **masonry foundation**. Ceiling height ranges from 9' to 17'. Lake-facing facade has Marvin low-E bronze-tinted windows.

HEATING: 5-ton Trane heat pump, 25-kilowatt **electric furnace**, and **wood-burning stove**

COOLING: Trane heat pump

ELECTRICAL: 200-amp single-phase and 200-amp **three-phase service panel**

LIGHTING: Ten 2x6' skylights, forty-eight 4' fluorescent lights, ten 75-watt recessed can lights

DUST COLLECTION: Oneida 3-hp cyclone, two JDS Air-Tech air cleaners

AIR COMPRESSOR: 10-hp Eagle

Lots of light

Skylights, fluorescent lights, canned lighting and a wall of windows give Mike sufficient **illumination**, day or night.

The floor plan

Mike's shop is built into the side of a hill, which dictated the position of the 8' sliding door on the back of the shop. **Materials are stored** just inside the door on **embedded cantilever-type racks** with adjustable arms, which were framed into the wall during construction. **Placing the radial-arm saw nearby** eases the job of cutting boards to length. With the **tablesaw** in front of the slider, it can be opened easily when **ripping an extra-long piece**. "We wanted storage close to the door so we didn't have to cart materials all over the shop," Mike says. "And we wanted the

cutoff saw close by. The next thing you use is the tablesaw and jointer. It was kind of like dominoes from there."

Router table riding on air

This 42" mobile **routing table** has an Inca precision router **lift** and Super System fence. Inside, a frame made of used **truck parts** and air bags allows Mike to raise the table off the floor and move it around the shop.

Storage space galore

Storage space abounds. The router table's multiple drawers **provide** plenty of storage for a set of **twist rings, plus cutters, routers,** and related equipment.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.

2. Составьте 10 предложений, используя максимальное количество новой лексики.

3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников.

4. Переведите:

- a) Dedicated outbuilding
- b) Ceiling height ranges from 9' to 17'.
- c) built into the side of a hill
- d) storage close to the door
- e) to cart materials all over the shop
- f) The router table's multiple drawers
- g) Trane heat pump

5. Составьте план пересказа текста.

6. Перескажите текст

WOOD AS A BUILDING MATERIAL; IT'S BENEFITS AND DISADVANTAGES

Introduction

For the long term **durability** of historical wooden buildings, **constructors** and users who deal with this subject have to know wood properties exactly.

Wood is an **organic, hygroscopic and anisotropic material**. Its thermal, acoustic, electrical, mechanical, aesthetic, working, etc. properties are very suitable to use it is possible to build a comfortable house using only wooden products. With other materials, it is almost impossible. But wood has some disadvantages too. Following is some very short information about this subject.

Benefits of wood

Thermal Properties:

As we know, many, materials **change in size** and **volume** as the **temperature** changes. They expand with increasing of the temperature. This means linear and **volumetric expansion**. The expansion. The expansion causes

decrease in the strength of materials. Steel, which is **inorganic and non-combustible** and therefore has an advantage against fire, but when used in buildings, it expands and collapses as a result of increase in heat.

Wood does not practically expand against heat. **On the contrary**, by the effect of heat, it dries out and gains **strength**. The only time wood expands a little is when the **humidity level** is below 0%, and this is only scientifically significant. In practice, the humidity level of wood does not drop under 5% even in the driest climate.

The **coefficient of thermal conductivity** of the wood is very low. Aluminium transmits heat 7000 times, steel 1650 times, marble 90 times and glass 23 times faster than wood. For this reason, wood is used for making matches, handles of hardware equipment, ceilings and wall coverings.

Specific heat of wood is high. That means high amount of energy is needed to increase and decrease the temperature of one-kilogram of wood. Wood requires almost twice amount of heat energy than stones and **concrete**; similarly, three times of energy is needed for heating or cooling steel.

Disadvantages of Wood:

- **Wood** energy produces green house gases.
- Transportation of **wood** to urban areas can be expensive.
- **Wood** is **hygroscopic** and it will absorb surrounding vapors **loses moisture** below the fiber saturation point.
- Biotic factors can cause decay of **wood** by mold fungi, bacteria and insects.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.

2. Составьте 10 предложений, используя максимальное количество новой лексики.

3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников..

4. Переведите:

- A. is possible to build
- B. Biotic factors
- C. For this reason, wood is used for making matches
- D. twice amount of heat energy
- E. to cart materials all over the shop
- F. expand against heat
- G. The expansion causes decrease

5. Составьте план пересказа текста.

6. Перескажите текст

THE 10 SAFETY RULES EVERY WOODWORKER SHOULD KNOW

Woodworking is among one of the safest and **enjoyable hobbies** you can do, provided you adhere to a set of rudimentary and easy to follow safety rules. These woodworking safety rules are designed to be easy to remember and are mostly common sense. That being said, **failure** to comply with the safety rules can cause serious injury. The work shop is not the place to be careless. It is the place to learn and adopt good **safety working habits** which will in turn make woodworking more fun and enjoyable.

1. Always Wear Safety Equipment

This might seem like a common sense kind of rule, but it's an important one to remember. During usage of loud power tools like routers and surface planers, wearing ear protection is a noted advantage. Similarly, wear latex gloves while applying finishes. Never be without your **safety glasses**. These should be the first thing you reach for when entering the shop.

2. Wear The Right Clothes

The problem with wearing **baggy** or loose clothes is the very high chance that a part of them might **get caught** in a cutting head or **saw blade**. As a result, try to always wear clothes that you are a better match for the woodworking environment, but also protect you. Also always **ensure** that any dangling **jewellery** or metal such as chains or bracelets, are removed before commencing work.

3. Avoid Using Anything That Can Impair Your Reaction Time and Judgement

It's like when you're driving a car: you want to stay out of the alcohol and drug cabinets to avoid accidents. In the wood shop, **the dangers** are even higher by inadvertently using the wrong tool because you're too out of it to see what you are doing wrong. **NEVER mix** alcohol with work, even if it's just a beer...or ten.

4. Disconnect Power

Always remember to disconnect the power source itself before changing blades or bits on your **power tools**. **In addition to** ensuring the switch is off, make sure there is no electricity being powered to the tool, since the switch can **malfunction** and/or accidentally get turned on.

5. Use A Single Extension Cord

Using one heavy duty extension cord for all your power tools will ensure that you switch off the power for each tool. Too many cords can get confusing and be a tripping hazard.

6. Never Use Blunt Blades & Bits

While this might seem obvious seeing as how dangerous a dull cutting tool can be. Dull tools will need to be made to work harder to cut and as a result can bind or **kick back**. Sharp bits and blades will ensure cleaner cuts as well.

7. Check Stock for Existing Metal

Before sawing through or making a cut, ensure that the piece of stock doesn't have existing nails, screws or other pieces of metal lodged into it already. Spinning blades and nails (and other pieces of metal) don't mix well together

causing damage to both the stock and the **cutting head**. It can also cause stock to kick back and cause injury, so always ensure (or use a metal detector to ensure for you) that the stock is clean.

8. Work Against The Cutter

Most power tools are built in a way that requires the **direction** a piece of wood moves through the tool, is the opposite direction of the cutting **head's movement**. So you need **to ensure** that the blade or router bit cuts against the motion of the wood instead of with it.

9. Never Reach Over A Running Blade

Always wait until a spinning blade has stopped moving before reaching to remove waste or cut-offs etc. Or to be on the extremely safe side, remove waste by using a push stick or piece of scrap so as to ensure an inadvertent power tool switch malfunction, doesn't turn deadly.

10. Minimize Distractions

When dealing with distractions, you want **to ensure** that you finish what you were doing (finishing a cut, especially when working with a power tool) before turning your **attention** elsewhere.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.

2. Составьте 10 предложений, используя максимальное количество новой лексики.

3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников.

4. Переведите:

- A. built in a way
- B. In the wood shop
- C. woodworking environment
- D. push stick or piece of scrap
- E. a piece of wood moves through the tool
- F. switch off the power
- G. to remove waste or cut-offs

5. Составьте план пересказа текста.

6. Перескажите текст

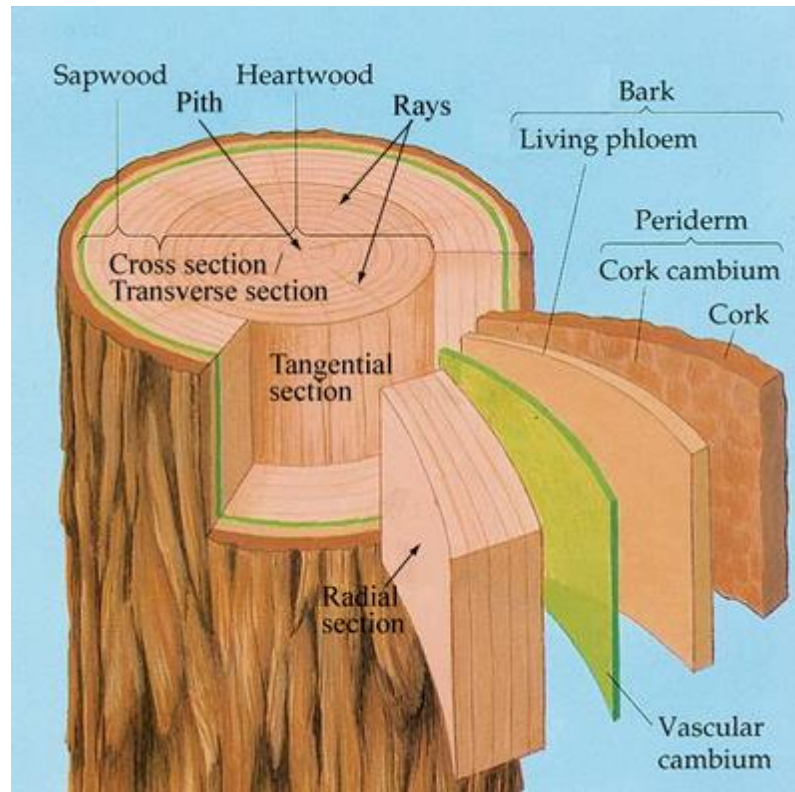


Рисунок 1 - Строение дерева

WOOD STRUCTURE

Wood is a **heterogeneous**, hygroscopic, cellular and anisotropic material. It consists of cells, and the cell walls are composed of **micro-fibrils** of cellulose (40–50%) and hemicellulose (15–25%) impregnated with lignin (15–30%).

In coniferous or **softwood** species the wood cells are mostly of one kind, tracheids, and as a result the material is much more uniform in structure than that of most hardwoods. There are no vessels ("pores") in coniferous wood such as one sees so prominently in oak and ash, for example.

The structure of **hardwoods** is more complex. The **water conducting capability** is mostly taken care of by vessels: in some cases (oak, chestnut, ash) these are quite large and distinct, in others (**buckeye, poplar, willow**) too small to be seen without a hand lens. In discussing such woods it is customary to divide them into two large classes, **ring-porous** and **diffuse-porous**.

In ring-porous species, such as ash, black locust, catalpa, chestnut, elm, hickory, mulberry, and oak, the larger vessels or pores (as cross sections of vessels are called) are localized in the part of the growth ring formed in spring, thus forming a region of more or less open and porous tissue. The rest of the ring, produced in summer, is made up of smaller vessels and a much greater proportion of wood fibers. These **fibers** are the elements which give strength and toughness to wood, while the vessels are a source of weakness.

In diffuse-porous woods the pores are evenly sized so that the water conducting capability is scattered throughout the growth ring instead of being

collected in a band or row. Examples of this kind of wood are **alder, basswood, birch, buckeye, maple, willow**, and the Populus species such as **aspen, cottonwood** and **poplar**. Some species, such as walnut and **cherry**, are on the border between the two classes, forming an intermediate group.

Hard and soft woods

It is common to classify wood as either softwood or hardwood. The wood from conifers (e.g. pine) is called softwood, and the wood from dicotyledons (usually broad-leaved trees, e.g. oak) is called hardwood. These names are a bit misleading, as hardwoods are not **necessarily hard**, and softwoods are not necessarily soft. The well-known balsa (a hardwood) is actually softer than any **commercial softwood**. Conversely, some softwoods (e.g. yew) are harder than many hardwoods.

There is a strong relationship between the properties of wood and the properties of the particular tree that yielded it. The density of wood varies with species. The density of a wood correlates with its strength (mechanical properties). For example, mahogany is a medium-dense hardwood that is excellent for fine furniture crafting, whereas balsa is light, making it useful for model building. One of the densest woods is black ironwood.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.

2. Составьте 10 предложений, используя максимальное количество новой лексики.

3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников.

4. Переведите:

- A. to classify wood as either softwood or hardwood
- B. The density of wood
- C. no vessels ("pores") in coniferous
- D. the particular tree that yielded
- E. In ring-porous species
- F. medium-dense hardwood
- G. commercial softwood

5. Составьте план пересказа текста.

6. Перескажите текст

WOOD CONSTRUCTION

Wood has been an important **construction material** since humans began building shelters, houses and boats. **Nearly** all boats were made out of wood until the late 19th century, and wood remains **in common** use today in boat construction. Elm in particular was used for this purpose as it resisted decay as long as it was kept wet (it also served for water pipe before the advent of more **modern plumbing**).

Wood **to be used for construction work** is commonly known as lumber in North America. Elsewhere, lumber usually refers **to felled trees**, and the word for sawn planks ready for use is timber. In Medieval Europe oak was the wood of choice for all wood construction, including beams, walls, doors, and floors. Today a wider variety of woods is used: solid wood doors are often made from poplar, small-knotted pine, and Douglas fir.

The churches of Kizhi, Russia are among a handful of World Heritage Sites built entirely of wood, without metal joints. See Kizhi Pogost for more details.

New **domestic housing** in many parts of the world today is commonly made from timber-framed construction. Engineered wood products are becoming a bigger part of the construction industry. They may be used in both **residential and commercial buildings** as structural and aesthetic materials

in buildings made of other materials, wood will still be found as a supporting material, especially in roof construction, in interior doors and their frames, and as exterior cladding.

Wood is also **commonly used** as shuttering material to form **the mold** into which concrete is poured during reinforced concrete construction.

Wood flooring

Solid wood floor is a floor laid with planks or battens created from a single piece of timber, usually a hardwood. Since wood is hygroscopic (it acquires and loses moisture from the ambient conditions around it) this potential instability effectively limits the length and width of the boards.

Solid hardwood flooring is usually cheaper than **engineered timbers** and damaged areas can be sanded down and refinished repeatedly, the number of times being limited only by the thickness of wood above the tongue.

Solid hardwood floors were originally used for structural purposes, being installed **perpendicular** to the wooden support beams of a building (the joists or bearers) and solid construction **timber** is still often used for sports floors as well as most traditional wood blocks, mosaics and parquetry.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.

2. Составьте 10 предложений, используя максимальное количество новой лексики.

3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников..

4. Переведите:

- A. Solid wood floor
- B. roof construction
- C. construction industry
- D. planks or battens
- E. hardwood floors
- F. Engineered wood products

- G. support beams of a building
5. Составьте план пересказа текста.
 6. Перескажите текст

ENGINEERED WOOD

Engineered **wood products**, glued building products "engineered" for **application-specific performance requirements**, are often used in construction and industrial applications. Glued engineered wood products are manufactured by bonding together wood strands, veneers, lumber or other forms of wood fiber with glue to form a larger, more efficient composite structural unit.

These products include **glued laminated timber** (glulam), **wood structural panels** (including **plywood**, oriented strand board and composite panels), laminated **veneer lumber** (LVL) and other structural composite lumber (SCL) products, parallel strand lumber, and I-joists. Approximately 100 million **cubic meters** of wood was consumed for this purpose in 1991. The trends suggest that particle board and fiber board will overtake plywood.

Wood **unsuitable for construction** in its native form may be broken down mechanically (into fibers or chips) or chemically (into cellulose) and used as a raw material for other building materials, such as engineered wood, as well as chipboard, hardboard, and medium-density fiberboard (MDF). Such wood derivatives are **widely used**: wood fibers are an **important component** of most paper, and cellulose is used as a component of some synthetic materials. Wood **derivatives** can be used for kinds of flooring, for example laminate flooring.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.
2. Составьте 10 предложений, используя максимальное количество новой лексики.
3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников.
4. Переведите:
 - F. Approximately
 - G. composite panels
 - H. suggest that particle board
 - I. In ring-porous species
 - F. widely used
 - G. native form
5. Составьте план пересказа текста.
6. Перескажите текст

WOOD MAIN PHYSICAL PROPERTIES

The main physical properties of wood include: color, luster, texture, macrostructure, odor, moisture, shrinkage, internal stresses, swelling, cracking, warping, density, sound - electro - **thermal conductivity**.

Color, shine, **texture** and macrostructure determine **the appearance of wood**.

Wood of different breeds have different color - from white - aspen, spruce to black - ebony. Tannins resin and pigments, founded in cells cavities, make wood more colorful.

Timber gloss - is the ability to reflect **light beam** pointedly. It depends on wood density, size and location of medullar rays, which reflect light rays pointedly, thereby creating the shine on the radial aspect. Beech wood, maple, oak, elm has the most characteristic luster. Aspen, poplar and linden has a matte surface due to a very narrow medullar rays, and thin cells walls. Wood gloss surface is enhanced and preserved for long periods of time by creating **transparent protective** - decorative coatings.

Texture - is a **peculiar pattern** formed by the **medullar rays**, fibers, and yearly layers of wood in different contexts. Texture saturation is determined by anatomical features of **arborous breeds' structure** and the section direction, and by the color of early and late wood, rippling and by mixed up **fiber arrangement**.

Macrostructure is characterized by the width of annual rings - the number of annual rings per 1 cm of segment, **measured in** the radial direction in cross section. Softwood have good **physical - mechanical features** when the number of layers varies from 3 to 25. The percentage of late wood in timber is determined by softwood samples. The higher late wood content in timber, the more the density and better mechanical wood characteristics.

Essential oils, resins, tannins and other substances, founded in certain tree species, give them a smell

Humidity - is the ratio of moisture mass in a given wood volume to the weight of absolutely dry wood, expressed as a percentage. **Moisture, soaking** the cell membrane, named the bound or hygroscopic, and moisture that fills the cavity of the cells and intercellular spaces, named free or capillary.

During **wood drying** free water evaporates firstly and connected water - at the end of the drying process. The condition of timber, when cell walls contain the maximum **amount of bound water**, and only air **fill the cavities**, named the limit of hygroscopicity. There are the following stages of wood humidity: wet - humidity above 100%, freshly - humidity 50 - 100% air - dry humidity 15 - 20% dry - moisture 8 - 12% completely dry - humidity near 0%.

Weight and electrical methods are used for humidity estimation. Using the weight method $W, \%$, humidity is determined by the formula $W = 100 (m_1 - m_2) / m_2$, where m_1 - mass of the wood sample before drying; m_2 - mass of the sample in an absolutely dry condition. Using electrical method, humidity is determined by

electrical moisture gauge. First method advantage - is an accuracy, second - is a quickness.

Shrinkage - is a reduction of **linear measurements** and wood volume during drying. Shrinkage occurs only during connected water evaporation. Shrinkage in the tangential direction is 6 - 10% in the radial 3 - 5% and along the grain 0.1 - 0.3%. **Decrease** of wood volume during connected water evaporation is called volumetric **shrinkage**. Full volumetric shrinkage of 12 - 15%. During bucking, **allowances for shrinkage** are foreseen, because carving wood and procurements have to be of a given size.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.

2. Составьте 10 предложений, используя максимальное количество новой лексики.

3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников..

4. Переведите:

A. mass of the wood sample before drying

B. More the density and better mechanical wood characteristics.

free water evaporates

C. due to a very narrow medullar rays,

D. is characterized by the width of annual rings

E. given size.

F. water evaporation

G. moisture gauge

5. Составьте план пересказа текста.

6. Перескажите текст

INTERNAL STRESSES, RESIDUAL INTERNAL STRESSES, WARPING, ELECTRICAL AND SOUND CONDUCTIVITY.

Internal stresses - are stresses in the wood - round **carving wood** and sawn timber without an application of external forces. Its reason - is an inequality of moisture distribution along section of drying wood. In majority of **wood drying** technologies, water evaporates firstly from surface wood layers. And if it will be less than hygroscopic limit, that is 30%, shrinkage is happening. At the same time internal layers remain more humid, and this makes the process of surface layers **shrinkage** more difficult. In the issue internal tension occurs in timber, and this tension stretch the wood out in surface zones and squeeze in internal. When the wood humidity is decreasing out of the **hygroscopic limit** in internal zone, it will be also dry. In the **issue** traction tension in surface zone is decreasing, but not fully. Because of residual lengthening in surface layers normal shrinkage will be delayed.

The process of **technical drying** in a vacuum infrared, in which these problems do not arise, is absolutely different.

Residual internal stresses in the dried sawn timber could **cause** changes in linear dimensions and shape of parts during their machining. The presence of stresses in the wood set with the cutting of the boards **power sections**. If **immediately** after section manufacturing their cogs will remain parallel, there are no internal stresses in wood, if they will **disperse**, in the external layers - stretching, and in the interior - compressive stresses: if cogs sections will be brought together - in the **outer layers of compression**, and in the interior - the tensile stresses.

Preserved after **drying**, the residual stresses could be removed through additional processing of sawn timber, wetting **the surface** with steam - or steaming water - spraying.

Warping - is a change in the form of the cross section during drying or wetting wood. Warping could be transverse and longitudinal. Lateral buckling is expressed by changing the form of **board section**. Its reason - is different shrinkage in the radial and tangential directions.

Along the length sawn could warp, acquiring an arched shape or helical surface shape.

During moistening and increasing of connected water content, wood swelling takes place - an increase of linear dimensions and volume of timber.

Sound conductivity - is a material property to conduct sound. It is characterized by the speed of sound spreading in the material. Along the grain in the wood sound spreads at a speed of 5000 m / s in the radial direction - 2000 m / s, tangentially - 1500 m / sec. Sound conductivity of wood is different in longitudinal and transverse directions. This property of wood and its ability to resonate - to amplify sound without distortion tones is used in the manufacturing of musical instruments. The best material for them - spruce, fir, Caucasian and Siberian cedar.

Electrical conductivity of wood is characterized by its resistance to the passage of electrical current. It depends on wood species, temperature, humidity and the grain of the wood. Electrical conductivity of dry wood is **negligible**, which allows to use it as an insulating material - a wall outlet plugs and switches. With an increase in humidity from 0 to 30% **electrical resistance** of wood falls in million times. The electrical resistance of wood along the grain in several times lower than across the grain.

Thermal conductivity - is the ability of the material to store heat. Wood has low thermal conductivity, since it has a lot of voids **filled** with air. **Therefore**, the thermal conductivity of wood depends on its humidity: the less the moisture, the lower the thermal conductivity.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.

2. Составьте 10 предложений, используя максимальное количество новой лексики.

3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников..

4. Переведите:

- A. an inequality of moisture distribution
- B. It depends on wood species
- C. allows to use it as an insulating material
- D. Along the length sawn could warp
- E. could be removed through additional processing of sawn timber
- F. is different in longitudinal and transverse directions.
- G. linear dimensions

5. Составьте план пересказа текста.

6. Перескажите текст

MECHANICAL PROPERTIES OF WOOD

Mechanical properties include strength, **toughness**, hardness, **elasticity**, plasticity, brittleness, the ability of wood to hold metal fasteners, wear resistance.

Durability - is the ability of wood to resist degradation (**tension, compression, bending, shear**, etc.) under the action of external forces. Dense wood is generally more durable. Strength decreases **rapidly** with the increasing wood **moisture**. Strength reduces rapidly if there are any defects in wood.

Depending on the strength of the material allowable stresses are established, to which material could be exposed without integrity damages. **The value** of allowable stress is always much lower than the tensile strength, i.e. the lowest stress values at which a destruction of the material takes place.

Heterogeneous **fibrous** wood structure stipulates its unequal in different directions relatively to fibers. It resists the action of forces, tensile or compressive component along the grain, and bending forces directed across the grain, much lower resistance to compression across the grain of wood and chipping along and across the fibers. Thus, resistance to chipping wood along the grain is 1,3-1,5 times greater than the resistance to chipping across the grain, and in a direction perpendicular to the fibers (end-grain) - in 3.5 times greater.

Impact strength - is the ability of wood to absorb the work without breaking.

Hardness - is the feature of wood to resist the introduction of body of a certain form. The hardness of the end surface is higher tangential and radial hardness to 30% for hardwood and 40% for softwood. According to the degree of hardness all tree species could be divided into three groups: mild - mechanical strength 40 MPa or less (spruce, pine, cedar, fir, poplar, linden, aspen, alder); solid - mechanical hardness 40-180 MPa (larch, birch, beech, oak, elm, elm, elm, sycamore, maple, hazel, walnut, apple, ash) are very solid - mechanical strength over 80 MPa (locust, birch, steel, hornbeam, dogwood, boxwood, yew).

Resilience - is the ability of timber to restore the original shape after the termination of the external forces. If these forces exceed a certain amount (the limit of elasticity), wood is either destroyed or change its shape.

Plasticity - is the feature of wood to change its original shape under the action of applied forces and keep a new form after termination of the force. Bending, stamping, etc are based on this feature. Deciduous wood breeds are better come under the bending (oak, ash, etc.) and absent-mindedly - vascular. Conifers have low ability to bend. Wet wood has higher ability to bend than dry wood.

Fragility - is the ability of wood to break down suddenly without significantly shape changing under the action of mechanical forces.

Cleavability - is the ability of wood to break down along the grain during penetration a wedge-shaped body into it. Wedge or hatchet, embedded into the wood, moves fiber apart, bend them to different sides and separates one part of fiber from another, forming a crack that goes in front of the blade of the wedge. It is easy to break up all **the conifers** and from hardwoods - beech, aspen, basswood, oak.

The ability of wood **to hold** metal fasteners - is **a feature**, explained by the wood elasticity. When hammering **a nail** fibers move apart partially, putting pressure on the lateral surface, causing the mutual friction, that keeps the nail in the wood. The resistance of wood to pulling of screws approximately in 2 times greater than the resistance of pulling nails.

The wear resistance of wood is characterized by the ability to resist wear and tear, ie, the destruction in the friction process. **Planks** wear and tear from the lateral surface more than from machined side. Wear and tear decreases with increasing hardness and density of wood. Wet wood wears out more quickly than dry.

Severability - is a feature of wood to divide into parts of wood under the action of forces. machining of wood with the removal of chips is based on this feature - sawing, milling, turning, grinding, and without removing material - cutting materials on shears, punching, chopping or bundling of wood - wood for logs, wood chips on the needle-shaped shaving, a big chip on the micro - and fibrous.

Задания

1. Выпишите и переведите выделенные слова и словосочетания. Выучите их.

2. Составьте 10 предложений, используя максимальное количество новой лексики.

3. Задайте 10 вопросов к тексту. Будьте готовы отвечать на вопросы одноклассников.

4. Переведите:

- A. strength of the material
- B. to divide into parts of wood
- C. move apart partially
- D. tear from the lateral surface more than from machined side..

E. According to the degree of hardness

F. to resist degradation

5. Выпишите все породы деревьев названные в тексте.

6. Составьте план пересказа текста.

7. Перескажите текст

Заключение

Высокий уровень профессиональной компетенции специалиста достигается наличием у него определенного набора профессиональных умений и навыков.

Иноязычные умения и навыки успешно реализуются в составе коммуникативной компетенции лишь тогда, когда они соответствуют профессиональным умениям и навыкам, зафиксированным в нашей стране Федеральным государственным стандартом среднего профессионального образования.

Данная методическая разработка предполагает формирование у студентов навыков и умений иноязычного общения в конкретных профессиональных, деловых, научных сферах и ситуациях и по завершении курса обучения наличие следующих умений.

Чтение:

✓ умение читать со словарем тексты, тематически связанные со специальностью студента;

✓ умение читать тексты, смысловая ситуация которых может служить предметом беседы, высказываний и обсуждения на иностранном языке.

Письмо:

✓ умение с помощью словаря изложить в письменной форме содержание текста;

✓ умение правильно писать слова и словосочетания, входящие в лексический минимум, определенный программой;

Устная речь:

✓ умение выражать свои мысли в устной форме по пройденной тематике, относящейся к учебной и производственной деятельности студента и его специальности.

✓ понимать на слух речь, содержащую усвоенный языковой материал; допускается использование незнакомой лексики, значение и смысл которой раскрывается на основе умения пользоваться языковой и лексической догадкой;

✓ иметь представление о культурных традициях в странах изучаемого языка.

Письмо и учебный перевод в курсе обучения рассматривается не как цель, а как средство обучения, входящее в систему упражнений при объяснении, закреплении и контроле языкового материала и его понимания при чтении.

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