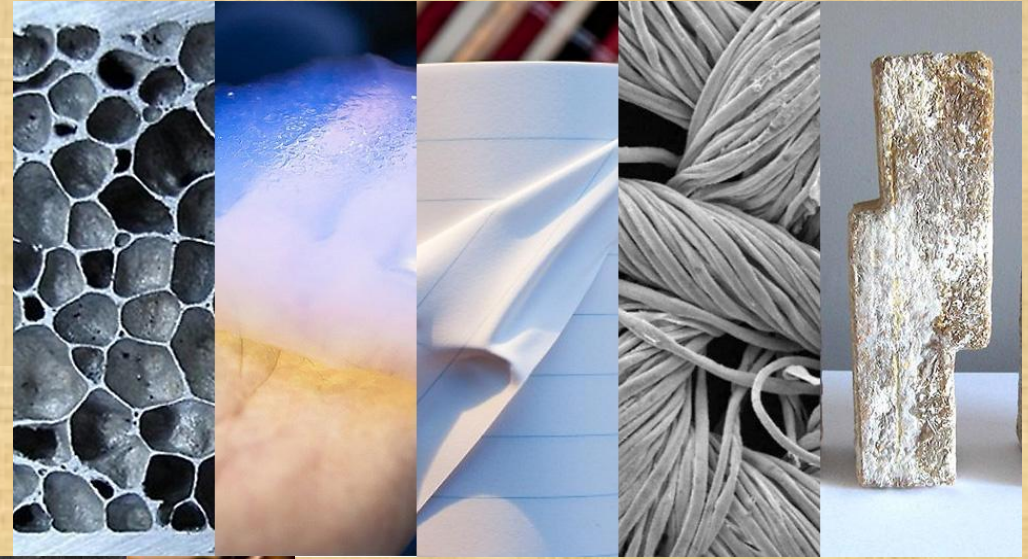


# ***Materials***

**Presentation was prepared by students of the group 23332/1  
Ostashkov Alexander and Sergey Babkin**

***Never thought about what it all consists of?***





# ***The main themes of the narrative***

- tell about the history of materials development;
- to introduce you to a variety of types of materials;
- draw a conclusion about advantages and disadvantages materials.

# ***Why this topic is very important for engineers?***

- understanding the structure of materials allows you to create workable structures;
- there is an opportunity to improve the mechanism by replacing the material used;
- knowledge of specific properties allows you to avoid fatal errors.

<div>H</div> <div>Hydrogen</div> <div>1</div>																	<div>He</div> <div>Helium</div> <div>2</div>						
<div>Li</div> <div>Lithium</div> <div>3</div>	<div>Be</div> <div>Beryllium</div> <div>4</div>																	<div>B</div> <div>Boron</div> <div>5</div>	<div>C</div> <div>Carbon</div> <div>6</div>	<div>N</div> <div>Nitrogen</div> <div>7</div>	<div>O</div> <div>Oxygen</div> <div>8</div>	<div>F</div> <div>Fluorine</div> <div>9</div>	<div>Ne</div> <div>Neon</div> <div>10</div>
<div>Na</div> <div>Sodium</div> <div>11</div>	<div>Mg</div> <div>Magnesium</div> <div>12</div>																	<div>Al</div> <div>Aluminum</div> <div>13</div>	<div>Si</div> <div>Silicon</div> <div>14</div>	<div>P</div> <div>Phosphorus</div> <div>15</div>	<div>S</div> <div>Sulfur</div> <div>16</div>	<div>Cl</div> <div>Chlorine</div> <div>17</div>	<div>Ar</div> <div>Argon</div> <div>18</div>
<div>K</div> <div>Potassium</div> <div>19</div>	<div>Ca</div> <div>Calcium</div> <div>20</div>	<div>Sc</div> <div>Scandium</div> <div>21</div>	<div>Ti</div> <div>Titanium</div> <div>22</div>	<div>V</div> <div>Vanadium</div> <div>23</div>	<div>Cr</div> <div>Chromium</div> <div>24</div>	<div>Mn</div> <div>Manganese</div> <div>25</div>	<div>Fe</div> <div>Iron</div> <div>26</div>	<div>Co</div> <div>Cobalt</div> <div>27</div>	<div>Ni</div> <div>Nickel</div> <div>28</div>	<div>Cu</div> <div>Copper</div> <div>29</div>	<div>Zn</div> <div>Zinc</div> <div>30</div>	<div>Ga</div> <div>Gallium</div> <div>31</div>	<div>Ge</div> <div>Germanium</div> <div>32</div>	<div>As</div> <div>Arsenic</div> <div>33</div>	<div>Se</div> <div>Selenium</div> <div>34</div>	<div>Br</div> <div>Bromine</div> <div>35</div>	<div>Kr</div> <div>Krypton</div> <div>36</div>						
<div>Rb</div> <div>Rubidium</div> <div>37</div>	<div>Sr</div> <div>Strontium</div> <div>38</div>	<div>Y</div> <div>Yttrium</div> <div>39</div>	<div>Zr</div> <div>Zirconium</div> <div>40</div>	<div>Nb</div> <div>Niobium</div> <div>41</div>	<div>Mo</div> <div>Molybdenum</div> <div>42</div>	<div>Tc</div> <div>Technetium</div> <div>43</div>	<div>Ru</div> <div>Ruthenium</div> <div>44</div>	<div>Rh</div> <div>Rhodium</div> <div>45</div>	<div>Pd</div> <div>Palladium</div> <div>46</div>	<div>Ag</div> <div>Silver</div> <div>47</div>	<div>Cd</div> <div>Cadmium</div> <div>48</div>	<div>In</div> <div>Indium</div> <div>49</div>	<div>Sn</div> <div>Tin</div> <div>50</div>	<div>Sb</div> <div>Antimony</div> <div>51</div>	<div>Te</div> <div>Tellurium</div> <div>52</div>	<div>I</div> <div>Iodine</div> <div>53</div>	<div>Xe</div> <div>Xenon</div> <div>54</div>						
<div>Cs</div> <div>Cesium</div> <div>55</div>	<div>Ba</div> <div>Barium</div> <div>56</div>	<div>* La</div> <div>Lanthanum</div> <div>57</div>	<div>Hf</div> <div>Hafnium</div> <div>72</div>	<div>Ta</div> <div>Tantalum</div> <div>73</div>	<div>W</div> <div>Tungsten</div> <div>74</div>	<div>Re</div> <div>Rhenium</div> <div>75</div>	<div>Os</div> <div>Osmium</div> <div>76</div>	<div>Ir</div> <div>Iridium</div> <div>77</div>	<div>Pt</div> <div>Platinum</div> <div>78</div>	<div>Au</div> <div>Gold</div> <div>79</div>	<div>Hg</div> <div>Mercury</div> <div>80</div>	<div>Tl</div> <div>Thallium</div> <div>81</div>	<div>Pb</div> <div>Lead</div> <div>82</div>	<div>Bi</div> <div>Bismuth</div> <div>83</div>	<div>Po</div> <div>Polonium</div> <div>84</div>	<div>At</div> <div>Astatine</div> <div>85</div>	<div>Rn</div> <div>Radon</div> <div>86</div>						
<div>Fr</div> <div>Francium</div> <div>87</div>	<div>Ra</div> <div>Radium</div> <div>88</div>	<div>** Ac</div> <div>Actinium</div> <div>89</div>	<div>Rf</div> <div>Rutherfordium</div> <div>104</div>	<div>Db</div> <div>Dubnium</div> <div>105</div>	<div>Sg</div> <div>Seaborgium</div> <div>106</div>	<div>Bh</div> <div>Bohrium</div> <div>107</div>	<div>Hs</div> <div>Hassium</div> <div>108</div>	<div>Mt</div> <div>Mitlerium</div> <div>109</div>	<div>Ds</div> <div>Darmstadtium</div> <div>110</div>	<div>Rg</div> <div>Roentgenium</div> <div>111</div>	<div>Cn</div> <div>Copernicium</div> <div>112</div>	<div>Uut</div> <div>Ununtrium</div> <div>113</div>	<div>Fl</div> <div>Flerovium</div> <div>114</div>	<div>Uup</div> <div>Ununquadium</div> <div>115</div>	<div>Lv</div> <div>Livermorium</div> <div>116</div>	<div>Uus</div> <div>Ununseptium</div> <div>117</div>	<div>Uuo</div> <div>Ununoctium</div> <div>118</div>						
			<div>La</div> <div>Lanthanum</div> <div>57</div>	<div>Ce</div> <div>Cerium</div> <div>58</div>	<div>Pr</div> <div>Praseodymium</div> <div>59</div>	<div>Nd</div> <div>Neodymium</div> <div>60</div>	<div>Pm</div> <div>Promethium</div> <div>61</div>	<div>Sm</div> <div>Samarium</div> <div>62</div>	<div>Eu</div> <div>Europium</div> <div>63</div>	<div>Gd</div> <div>Gadolinium</div> <div>64</div>	<div>Tb</div> <div>Terbium</div> <div>65</div>	<div>Dy</div> <div>Dysprosium</div> <div>66</div>	<div>Ho</div> <div>Holmium</div> <div>67</div>	<div>Er</div> <div>Erbium</div> <div>68</div>	<div>Tm</div> <div>Thulium</div> <div>69</div>	<div>Yb</div> <div>Ytterbium</div> <div>70</div>	<div>Lu</div> <div>Lutetium</div> <div>71</div>						
			<div>** Ac</div> <div>Actinium</div> <div>89</div>	<div>Th</div> <div>Thorium</div> <div>90</div>	<div>Pa</div> <div>Protactinium</div> <div>91</div>	<div>U</div> <div>Uranium</div> <div>92</div>	<div>Np</div> <div>Neptunium</div> <div>93</div>	<div>Pu</div> <div>Plutonium</div> <div>94</div>	<div>Am</div> <div>Americium</div> <div>95</div>	<div>Cm</div> <div>Curium</div> <div>96</div>	<div>Bk</div> <div>Berkelium</div> <div>97</div>	<div>Cf</div> <div>Californium</div> <div>98</div>	<div>Es</div> <div>Einsteinium</div> <div>99</div>	<div>Fm</div> <div>Fermium</div> <div>100</div>	<div>Md</div> <div>Mendelevium</div> <div>101</div>	<div>No</div> <div>Nobelium</div> <div>102</div>	<div>Lr</div> <div>Lawrencium</div> <div>103</div>						

Alkaline earth metal

**Lanthanide**

■ Post-transition metal

 Polyatomic nonmetal

**Noble gas**



# ***How it all began***



The first building materials were stone and wood



# ***Later people started using more progressive materials***

Bronze



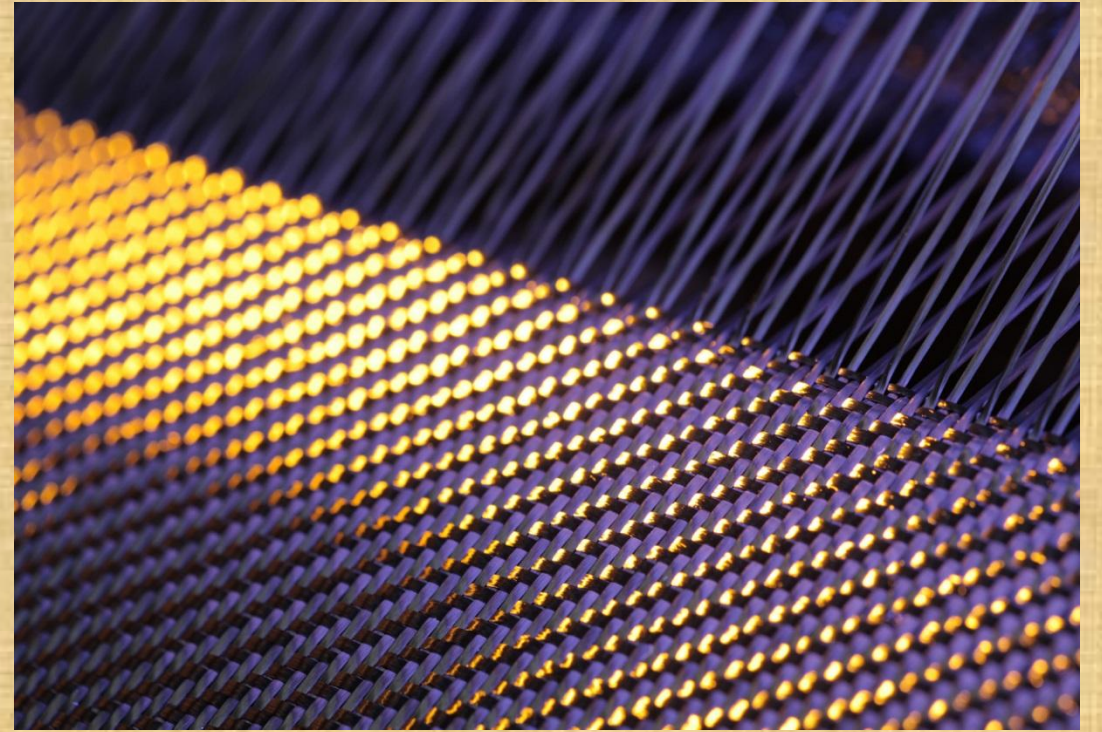
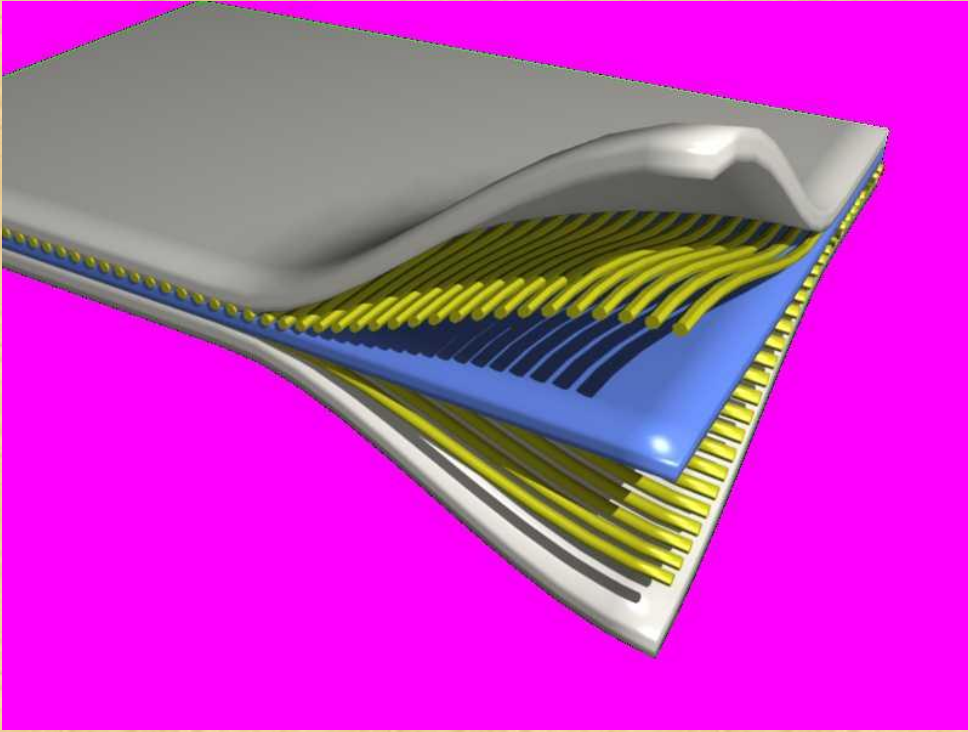
Metal



Steel



# ***Advanced materials***



Composite materials allow constructing mechanisms with special properties



## *At the end*



At the end of our narrative I would like to ask you what is the most common material in the modern world? And why?

***Thank you for attention***