**Ceramics**

* Origins of ceramics
  + Word ceramics derives from the Greek word keramos/keramikos, meaning “a potter” or “made of clay”
  + One of the oldest human crafts
  + The oldest ceramic object discovered is the statue of Venus
  + The potter’s wheel has become a tool for creating pottery (Mesopotamia, 6000-4000 BC)
* Raw materials
  + Plastic base
    - Ball clay
    - Stoneware clay
    - Kaolin
  + Fluxes (tavivá)
    - Silica
    - Feldspar
    - Talc
  + Fillers (ostrivá)
    - Limestone
    - Other
  + Colours/dyers
    - Metal oxides
* Pottery products
  + Earthenware
    - Brown, orange
    - Are fired at 1000 to 1200 °C
  + Stoneware
    - Off white to grey
    - 1100 to 1300°C
  + Porcelain
    - White, very brittle
    - 1200 to 1400°C
* Basic processes
  + Preparation of powders
  + Forming and shaping
    - Hand-building
    - Potter’s wheel
    - Granulates pressing
    - Injection moulding
    - 3D Printing
  + Drying
    - More stressful than firing
    - Many varieties of dryers such as band, batch and tunnel, they are used together with electrical and bottle kilns
  + Firing
    - It undergoes chemical changes
* Finishing processes
  + Application of glaze
  + Glost firing
  + Decoration
* Ceramic materials
  + Are inorganic, non-metallic materials
  + Are formed by heating and subsequent cooling
  + Properties of ceramic materials
    - Extreme hardness
    - Brittleness
    - Heat and corrosion resistance
    - High melting temperature
    - Very good chemical and thermal stability
* Types of ceramics
  + According to the porosity
    - Porous ceramics (ball clay, kaolin, bentonite)
    - Non-porous ceramics (adding feldspar)
    - Hard ceramics (+ flint, quartz)
  + According to the usage
    - Utility ceramics
      * Products for baking, storing or serving food made mostly of porcelain and pottery
    - Decorative ceramics
      * The emphasis is on the artistic side
      * Vases, candlesticks, ashtrays
      * Folk ceramics – jugs, plates for hanging
    - Technical ceramics
      * Used for technical purposes
      * Divided into
        + Building ceramics – bricks, tiles
        + Chemical stoneware – pumps, pipes, sinks
        + Sewage ceramics – waste water drainage
  + According to the assortment
    - Whiteware
    - Redware
  + Other classifications
    - Traditional ceramics
      * Normally made of clay, silica and feldspar
      * Products:
        + Pottery
        + Tableware
        + Stoneware
        + Tiles
        + Bricks
        + Electrical porcelain
    - Advanced ceramics
      * Developed over the past 60 years
      * Special type of ceramics – electroceramics (optical, magnetic), nuclear and bioceramics (teeth, bones and joint replacements)
* Ceramics in Slovakia
  + The influence of HABANS (came from Alpine countries)
  + HABAN faience – a fine glazed earthenware used for ornamental and decorative purposes.
  + Our territory – 16 – 17th century
  + MAIOLICA - glazed ceramics with white background
  + Centres of ceramics in Slovakia:
    - Modra – white base glaze, flower ornaments
    - Sladice – similar to Modra and Haban faience
    - Ľubietová – brown base glaze, white ornaments
    - Pozdišovce – black base glaze, typical dance ornaments
* Chinese porcelain
  + Chinese were far ahead of the rest of the world
  + JINGDEZHEN – the birthplace of Chinese porcelain, 1000 B.C. (TANG Dynasty)
  + Greatest development during HAN dynasty (206 B.C. – 220 A.D.)
  + Classification
    - BONE China – lower firing temperature, cow bone ash is used – milky white colour, smoother glaze, more expensive
    - FINE China – no bone content, heavier in weight, offwhite