Strand:	Creative Arts	**Sub-Strand:**	Media and Techniques
Content Standard:	B9. 2.1.1. Demonstrate understanding and apply media and techniques in casting, assemblage and folding		

BASIC 9

WEEKLY LESSON PLAN – WEEK 7

Indicator (s)	B9. 2.1.1.2 Experiment by using techniques in casting to create visual artworks		**Performance Indicator** Learners can apply casting techniques to create their own visual artworks.		
Week Ending	**17-11-2023**				
Class	B.S.9	**Class Size:**		**Duration:**	
Subject	Creative Arts & Design				
Reference	Creative Arts & Design Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook.				
Teaching / Learning Resources	Screws and nails, Poster and video showing techniques in casting		**Core Competencies:**	• Communication and Collaboration. • Critical Thinking and Problem Solving. • Creativity and Innovation.	

DAY/DATE	**PHASE 1 : STARTER**	**PHASE 2: MAIN**	**PHASE 3: REFLECTION**
WEDNESDAY	Show Learners samples, pictures and video of examples of visual artworks made through casting.	1. Discuss with the Learners about the processes the identified visual artworks pass through before they were made. 2. Assist Learners to apply casting techniques to create their own cast artworks. 3. Engage Learners in watching a video on how casting of metal is done. **Metal**  In metalworking, metal is heated until it becomes liquid and is then poured into a mold. The mold is a hollow cavity that includes the desired shape, but the mold also includes runners and risers that enable the metal to fill the mold. The mold and the metal are then cooled until the metal solidifies. The solidified part (the casting) is then recovered from the mold. Subsequent operations remove excess material caused by the casting process (such as the runners and risers). **Plaster, concrete, or plastic resin** Plaster and other chemical curing materials such as concrete and plastic resin may be cast using single-use *waste* molds as noted above, multiple-use 'piece' molds, or molds made of small rigid pieces or of flexible	Reflect on the techniques for casting. **Exercise;** State 5 examples of visual artworks made through casting.

material such as latex rubber (which is in turn supported by an exterior mold). When casting plaster or concrete, the material surface is flat and lacks transparency. Often topical treatments are applied to the surface. For example, painting and etching can be used in a way that give the appearance of metal or stone. Alternatively, the material is altered in its initial casting process and may contain colored sand so as to give an appearance of stone. By casting concrete, rather than plaster, it is possible to create sculptures, fountains, or seating for outdoor use. A simulation of high-quality marble may be made using certain chemically-set plastic resins (for example epoxy or polyester which are thermosetting polymers) with powdered stone added for coloration, often with multiple colors worked in. The latter is a common means of making washstands, washstand tops and shower stalls, with the skilled working of multiple colors resulting in simulated staining patterns as is often found in natural marble or travertine.

Fettling

Raw castings often contain irregularities caused by seams and imperfections in the molds, as well as access ports for pouring material into the molds. The process of cutting, grinding, shaving or sanding away these unwanted bits is called "fettling" in UK English. In modern times robotic processes have been developed to perform some of the more repetitive parts of the fettling process,[14] but historically fettlers carried out this arduous work manually, and often in conditions dangerous to their health. Fettling can add significantly to the cost of the resulting product, and designers of molds seek to minimize it through the shape of the mold, the material being cast, and sometimes by including decorative elements.

Casting process simulation

Casting process simulation uses numerical methods to calculate cast component quality considering mold filling, solidification and cooling, and provides a quantitative prediction of casting mechanical properties, thermal stresses and distortion. Simulation accurately describes a cast component's quality up-front before production starts. The casting rigging can be designed with respect to the required component properties. This has benefits beyond a reduction in pre-production sampling, as the precise layout of the complete casting system also leads to energy, material, and tooling savings.

The software supports the user in component design, the determination of melting practice and casting methoding through to pattern and mold making, heat treatment, and finishing. This saves costs along the entire casting manufacturing route. Casting process simulation was initially developed at universities starting from the early '70s, mainly in Europe and in the U.S., and is regarded as the most important innovation in casting technology over the last 50 years. Since the late '80s, commercial

		programs (such as AutoCAST and MAGMA) are available which make it possible for foundries to gain new insight into what is happening inside the mold or die during the casting process.	
THURSDAY	Review Learners knowledge on the previous lesson.	1. Discuss with the Learners about the importance of Casting in visual arts. 2. Learners brainstorm to identify hazards and safety precautions to be taking when casting. 3. Assist Learners to describe ways to prevent hazards associated with Casting. 4. Learners in small groups to discuss and report to the class on the advantages and disadvantages of metal casting.  **The importance of metal casting;** • Casting simplifies the process of forming metal into products. Process; -Molten metal is poured into a mold to create a desired pattern. To remove the pattern or part, a slight taper, often called a draft, is used on the pattern surfaces. If needed, passages, or cavities, within the casting are made by inserting cores into the casting box once the pattern is removed. • The importance of casting in the manufacturing process is significant. A casting results in fewer components and fewer parts needing to be put together. A weldment that was once a dozen	Through questions and answers, conclude the lesson. **Exercise** Explain 5 importance of metal casting.

		pieces can be cast into one part, resulting in less assembly time, simpler inventory control, and a drop in overall price. Plus, the overall versatility of casting is incredible. **Advantages of metal casting processes** The benefits of manufacturing metal parts with the casting process include: 1. Metal casting processes can manufacture workpieces with complex shapes especially complicated internal cavities, such as boxes, cylinder blocks, etc.; 2. Wide range of adaptations; 3. The metal casting process can utilize low-cost iron and steel scrap, milling debris, etc., and casting equipment is relatively low. 4. The size and weight are almost unrestricted with metal casting workpieces; 5. The shape and size of the castings are very close to the workpiece. Therefore the metal casting process reduces the amount of further machining work and saves the metal materials. **Disadvantages of metal casting processes** Along with its advantages, the metal casting process also has disadvantages, including 1. The relatively more involved production operations make casting processes more challenging to be fully controlled; 2. The casting workpieces are more prone to take with casting defects; 3. Relatively poor dimensional consistency and accuracy; 4. Compared with forgings of the same size and shape, the intrinsic quality of castings is weaker, and the load-bearing capacity is less than that of forgings; 5. Poor working environment with high temperature, dust, and high labor intensity	