

BASIC 9

EaD Comprehensive Lesson Plans

Strand:	Tools, Equipment and Processes	Sub-Strand:	Cutting/Shaping
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<https://www.TeachersAvenue.net>

<https://TrendingGhana.net>

<https://www.mcgregorinriis.com>

Content Standard:	B9.3.2.1 Demonstrate the understanding of cutting/shaping tools and equipment used for making artefacts/ products.				
Indicator (s)	B9.3.2.1.1: Identify and classify tools and equipment used for cutting and shaping		Performance Indicator: learners can use cutting and shaping tools.		
Week Ending	02-02-2024				
Class	B.S.9	Class Size:		Duration:	
Subject	Career Technology				
Reference	Career Technology Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook.				
Teaching / Learning Resources	Poster, Pictures, Charts, Video.		Core Competencies:	<ul style="list-style-type: none">• Critical Thinking and Problem Solving• Communication and Collaboration.	
DAY/DATE	PHASE 1 : STARTER	PHASE 2: MAIN			PHASE 3: REFLECTION
WEDNESDAY	Assist the Learners to explain “Cutting tools”.	<div>1. Learners brainstorm to identify examples of cutting and shaping tools used at building sites, kitchen and wood workshops.</div> <div>2. Assist Learners to describe the uses of cutting and shaping tools in the kitchen, building sit and inn wood workshops.</div> <div>3. Demonstrate to make a wooden table using cutting and shaping tools.</div> <div>What is cutting tool? Cutting tool is a wedge shaped and sharp edged device that is used to remove excess layer of material from the workpiece by shearing during machining in order to obtain desired shape, size and accuracy. It is rigidly mounted on the machine tool. A relative velocity between workpiece and cutting tool is also provided by various mechanical and other arrangements for cutting action.</div> <div>Examples of cutting tools Cutting tool is basically the cutter used in machining operation. Various machining operations utilize different cutters and thus various names are available for these cutters based on the application. A list of commonly used cutting tools is provided below.</div> <div>1. Single point turning tool—cutter for turning operation performed in lathe</div>			<div>Learners brainstorm to use cutting tools to cut fabrics and sew dresses.</div> <div>Exercise; State 5 examples of cutting and shaping tools.</div>

		<ol style="list-style-type: none"> 2. Drill—cutter for drilling operation performed on drilling machine or lathe or milling machine 3. Milling cutter (or mill)—cutter for milling operations performed on milling machine 4. Fly cutter—cutter for fly milling operation performed in milling machine 5. Shaper—cutter for shaping operation performed in shaping machine 6. Planer—cutter for planing operation performed in planing machine 7. Boring bar—cutter for boring operation performed in drilling or boring machine 8. Reamer—cutter for reaming operation performed in drilling machine 9. Broach—cutter for broaching operation performed in broaching machine 10. Hob—cutter for hobbing operation performed in hobbing machine 11. Grinding wheel—abrasive cutter for grinding operation performed in grinding machine. 	
FRIDAY	Discuss with the Learners about the geometrical features and designation of cutting and shaping tools.	<ol style="list-style-type: none"> 1. Assist learners to identify examples of materials used for making cutting and shaping. 2. Discuss with the Learners about the classifications of cutting and shaping tools. 3. Learners brainstorm to explain 5 importance of using cutting and shaping tools. <p>Materials of cutting tool</p> <p>During machining, part of the cutting tool remains in physical contact with the workpiece and thus experiences severe cutting temperature and insistent rubbing. The material of the cutting tool must have the capability to sustain such high cutting temperature as well as cutting force. Every tool material must possesses certain properties such as high hardness, high hot hardness, high strength, higher melting point and chemically inert even at high cutting temperature. As a thumb rule, the hardness of the tool material should be at least 1.5 times of the hardness of the workpiece for smooth cutting action.</p> <p>Suitable coating can also be applied on the tool to improve various desired properties. However, a coated tool does not allow easy re-sharpening by grinding when the edges are worn out after prolonged use. Now-a-days, insert based tools are available where small interchangeable inserts can be attached or clamped on large shank. These inserts perform cutting action and thus worn out gradually. When wear exceeds the tolerable limit, the inserts can be replaced by a new one, while the shank</p>	<p>Reflect on how to care and maintain for cutting and shaping tools.</p> <p>Exercise;</p> <p>Explain 3 types of cutting and shaping tools</p>

		<p>can be used repeatedly. Some of the tool materials commonly available in today's market are enlisted below.</p> <ul style="list-style-type: none"> • High Speed Steel (HSS) • Tungsten carbide • Ceramics • Cubic Boron Nitride (cBN) • Diamond <p>Classification of cutting tool</p> <p>Cutting tools can be classified in various ways; however the most common way is based on the number of main cutting edges that participate in cutting action at a time. On this basis, cutting tools can be classified into three groups as given below.</p> <ul style="list-style-type: none"> • Single point cutting tool—Such cutters have only one main cutting edge that participate in cutting action at a time. Examples include turning tool, boring tool, fly cutter, slotting tool, etc. • Double point cutting tool—As the name implies, these tools contain two cutting edges that simultaneously participate in cutting action at a pass. Example includes drill (common metal cutting drill that has only two flutes). • Multi-point cutting tool—These tools contain more than two main cutting edges that can simultaneously remove material in a single pass. Examples include milling cutter, broach, gear hobbing cutter, grinding wheel, etc. 	
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School:

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