

Lesson plan

Lesson 4

Trigonometry in engineering and manufacturing

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Lesson plan

Programme name	T Level: Technical qualification in design and development for engineering and manufacturing (8714)	Suggested duration	2 hours
Lesson topic	Trigonometry in engineering and manufacturing	Lesson	4 of 4

Session description and context, including any last-minute information

The lesson is designed to introduce contextualised trigonometry in engineering and manufacturing. The aim of the lesson is for learners to build upon their understanding gained in the three previous sessions.

This lesson is number four in a series of four. It has been created to give the learners a series of problems to work through and resolve so that they can build on their prior understanding.

Learning outcomes

By the end of the lesson, learners should be able to:

- apply trigonometry in various contextualised engineering and manufacturing scenarios.

Links to the specification

4.1 Applied mathematical theory in engineering applications.

Trigonometry: Pythagoras' theorem, triangle calculations, trigonometric, sine and cosine rules, and common trigonometric identities and values.

Lesson resources

Scientific calculator

Presentation slides

Timings	Slides	Teacher activity	Learner activity	Stretch and challenge
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5 mins	2	Introduction to the topic. This session builds on the experience and knowledge gained from the previous sessions.		
5 mins	3	Starter activity Encourage learners to complete the starter activity. Teacher to offer support and assistance if necessary.	Individual completion of activity.	
15 mins	4	Ask learners to complete activity 1 . Teacher to offer any support or guidance, as necessary, and ensure that learners are working individually and at own pace. Teacher to ask open and directed questions to ensure learners can show understanding.	Learners to work through activity 1 . Learners to complete example. Answer any open or directed questions if necessary.	
15 mins	5	Ask learners to complete activity 2 . Teacher to check learners are proceeding at an acceptable rate, offer support, advice and clarification if necessary, and check that more able learners are supporting peers rather than completing the examples for them.	Learners to complete activity 2 at their own pace.	More able learners to offer support to their peers to reinforce their own learning.
15 mins	6	Ask learners to complete activity 3 individually. Teacher to check learners progress and, if necessary, offer support and assistance to learners. Task more able learners with researching engineering applications for similar scenarios.	Learners to reproduce the diagrams from the scenario and to answer activity 3 .	If finished, more able learners to research similar engineering scenarios.
10 mins	7 - 8	Teacher to explain example of pitch hole diameter and spacings. Explain how to calculate the required angles and the hole spacings for the scenario.	Learners to reproduce the diagram. Learners to work through the example.	Missing

		Teacher to ask direct and open questions to check learners' understanding. Examples could include: Why did we divide 360 degrees by 5? How did we create a right angle? Why did we need to create a right angle?	Ask any questions or answer questions to clarify own understanding.	
10 mins	9	Ask learners to complete activity 4 . Teacher to ensure learners are working at an appropriate pace and get learners to write four things they have discovered on a post it note to clarify learners' understanding.	To complete activity 4 , learners will need to reproduce the diagram. Learners to work through the example.	Missing
20 mins	10	Ask learners to complete activity 5 . Teacher to offer support and assistance if necessary. Teacher to ask direct and open questions to check understanding.	Learners to complete activity 5 . They will need to show all workings including relevant diagrams used to complete the calculation.	Missing
20 mins	11	Ask learners to complete plenary activity . Teacher to offer support and assistance if necessary. Teacher to ask direct and open questions to check understanding. Examples could include: Which values will we need from the table? Where will we draw the triangle required? Which trigonometry function will we need?	Learners will reproduce the diagram then complete the plenary activity .	Missing
5 mins		Recap session, discuss whether the learning outcomes have been met and check understanding of learning outcomes.	Learners will be involved in an open discussion around the contents of the session and their own thoughts on the application of trigonometry.	Missing

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