Lesson Plan

Pillars of Growth: Advanced Manufacturing

Overview

This is a 60-minute session, with extension opportunities provided later in this document, where learners are introduced to the Advanced Manufacturing industry including potential careers and pathways. They are set a task, working in teams to produce as many model airplanes as they can within 20 minutes. Learners will choose from a set of variables, each impacting on how they may decide to complete their task. The winning group will be the group who generates the greatest net profit for their company.

Learning Objectives:

Aim: To learn about careers in the advanced manufacturing sector.

Objectives:

- To be able to describe what Advanced Manufacturing is and explain why this is a growth industry in Lancashire.
- To produce at least one (but hopefully more) completed model jet planes, working as a team effectively to maximise efficiency and quality of production.
- To evaluate a range of options related to the production process, intended to maximise net profit. Then complete a finance document to accurately calculate the net profit.
- To recognise potential careers and pathways into this sector.

Success Criteria:

- All learners will have worked in groups to produce multiple fully costed foam commercial jets to a high standard.
- Learners will be able to understand the importance of Advanced Manufacturing and identify opportunities within Lancashire to grow these industries.

Resources (provided):	Resources (additional):
Foam Sheets Glue Sticks Project Management Task spreadsheet Student Finance worksheets Facilitator Task sheets Commercial Airplane templates Scissors Fines Lesson Plan PowerPoint slides	Blu-tac (optional extension task)
Organisation: Facilitator will talk class through introduction slides, using the notes (or play the recorded video presenting the slides), before putting learners in groups and supporting them to build the model plane. To finish, facilitator will support in a short guided reflective activity to assist learners in recognising the positives and negatives of their working process. They will then go through the final slides on careers and pathways.	

Time	Facilitator's Activity	Learners' Activity
15 mins	**Session Intro** Introduce topic, explain objectives and success criteria and describe the Energy and Low Carbon sector and why it is significant.	**Session Intro** Learners listen, ask relevant questions and take notes where needed.
10 mins	**Task Intro** Place learners into group of 4. Explain the basic model-making process, the resources available and the variables which will impact on their success or otherwise.	**Task Intro** In groups of 4, learners discuss the best way to run their production line, the roles and responsibilities of each member and select from the various choices they are given.
20 mins	**Task** Facilitate learners to follow instructions and build the model plane. Perform quality control checks, completed planes not up to standard are to be eliminated (standard can be set by facilitator, looking for accuracy in cutting out,	**Task** Learners work in their group to produce the most model planes. Planes must be made to a standard which will pass a quality control test by the production line manager (teacher/facilitator) Learners must also complete the

	neatness and use of all individual parts).	finance document, to calculate their initial net profit.
(Optional Extension Task 20 mins)	(see next page)	(see next page)
10 mins	**Finding the Winner & Reflections** Check the calculation of each groups net profit to find the winning group (if extension task is completed, facilitator can use the flight results as the difference-maker between close groups). Reflection - What worked well, what could they improve, how?	**Finding the Winner & Reflections** Illustrate your work and answer self-reflection questions when prompted.
	Careers and Pathways Learn about the relevant pathways within this sector.	**Careers and Pathways** Look at the industry and potential for growth within Lancashire. Review education pyramid and discuss pathways.
5 mins	**Pack Up** Ensure all resources are returned and ask learners to tidy up.	**Pack Up** Return resources and tidy up your workspace.

Optional Extension Task 5 mins	**Iterative test flights** Explain how learners will use BluTack to provide a weight on the nose of a chosen plane which will improve flight performance. This is a testing process (iterative); learners should decide through testing; how much BluTack to use, who should be the test pilot and the best technique used to throw the plane with the aim of generating the most distance. As groups test, facilitator completes quality control checks, eliminating any planes that do not pass checks.	**Iterative test flights** Test the best approach to flying one chosen plane; how much BluTack to use, who in the team will be the test pilot, and the best throwing technique to generate the most distance.
15 mins	**Test flight competition** Organise the test pilots from each	**Test flight competition** Test Pilots fly their groups chosen

	group to fly their chosen planes. Each Pilot has three throws, only the longest is counted. Measure the distances and record the longest from each group.	plane. 3 attempts to record their longest flight. Rest of the group cheer!