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| **Scales of Production (Charity Keyrings)** | **AGE 14-16 (vocational ability)** |
| **Objectives**  | **Background**  |
| * To understand the scale of engineering production: mass.

Demonstrated by the following outcomes:* Identify what mass production is.
* Identify some advantages and disadvantages of mass production.
* Describe mass production to enable future comparisons.
 | This 1 hour session is the 7th of a unit of 10 lessons exploring scales of production, specifically one-off, batch, mass and continuous; this session explores mass production in more detail. |
| **The Big Questions** | **Curriculum Links**  |
| * What are scales of production?
* What types of products are produced at each scale?
* Why is one production scale sometimes preferable?
 | Pearson BTEC Level 1/Level 2 First Award in EngineeringUnit 1: The Engineered WorldLearning aim A: Know about engineering processes used to produce modern engineered productsTopic A3: Scales of productionCharacteristics and advantages/disadvantages of the following scales of production used in engineering manufacture:● one-off/jobbing production● batch production● mass production● continuous production. |
| **Unit Summary** |  |
| * This unit of work is a series of 10 lessons to allow students to develop knowledge of scales of production mainly through focused practical tasks. Students produce various key ring products as a live brief to raise money for charity (Children in Need).
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| **(Title)** | **AGE 11-14** |

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| **1 Resources**  | **5 Plenary**  |
| * Scales of Production 6-8 - Mass production PowerPoint
* Scales of Production Student Workbook

Mass Production Equipment:* Laser cutter (optional)
* Acrylic sheet
* Masking tape or permanent marker
* Coping saws (3+)
* Flat File (3+)
* Graded abrasive papers
* Pillar Drill with 3mm drills
* Key rings
 | *5 minutes*As practical work has taken place students need to ensure:* All work is stored safely and is identifiable.
* All tools are returned to the correct places.
* The workshop is left appropriately clean and tidy.
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| **2 Starter**  |
| 5 minutesStudents prepare to carry out their mass manufacturing of their charity key-ring. They need to:* Ensure all items not required are stored safely (blazers, bags, etc)
* Put on PPE (apron, goggles)
* Collect their own work
* Select tools required

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| **3 Introduction**  | **6 Follow up session**  |
| 10 minutesFollow-up issues from previous session with any required demos for class / group / individuals. Introduce research task -students should produce an A4 sheet with details of products produced using mass methods. Details on what the item is, how it is manufactured, costs etc. can be added as well as images. | Students continue the mass manufacture of their charity key ring in the next lesson in the unit, they will need to refine the way they are working as a group including any reallocation of job roles. |
|  **4 Activity** |  |
| 40 minutesStudents are to produce charity keyring as specified, including:* Process Raw Material – etch into surface of acrylic sheet the chosen design over a general area
* Prepare surface for marking / Mark surface from template mark chosen shape onto acrylic using masking tape and pencil or permanent marker.
* Quality Control Check – is the keyring etched correctly and marked correctly?
* Cut – using coping saws
* Quality Control Check – is the shape cut accurately (slightly too large)
* File – using flat files
* Rough Sand, Smooth Sand
* Quality Control Check – are all deep abrasions removed?
* Dry wet/dry, Wet wet/dry
* Drill – as marked using pillar drill
* Key ring – add to acrylic

Students will periodically need to refine the way they are working as a group including any reallocation of job roles. |