

A. Domain / Area / Subject

Stone Masonry, Vocational Education (VET)

B. Topic

Produce standard stonemasonry components

C. Age Group / Key Stage / Year / Background

16-24 Years

D. What is it about? / What's in your mind? / What's the matter?

This gamified lesson provides VET students a virtual cyber-physical system simulation and training on using power tools.

E. Play - Lesson Path

Planning – User will plan the cutting path, sequence, required number of passes, cutting depth, orientation of the stock and the tool, etc. System will assist his actions with its snapping and quick sketching features

Experiencing – User will experience the cutting process similar to a real-life setting. The time taken for this simulated experience is expected to be comparable and translatable to the time required to complete the process in real-life setting. Physical feedback and vibrations are also anticipated to have sufficient resolution to the cutting process. No virtual object snapping will be available in this mode to ensure untethered manipulation in the virtual environment and that is fully controlled by the user's movements.

What skills participants will develop? <i>Skills/Competencies</i>	What's the purpose? <i>Aims/Objectives</i>	How much time? <i>Time</i>	Who is taking part? <i>Players/Participants</i>	Where is the mission going to take place? <i>Places of Interest</i>	What is available for this mission? <i>Tools/Resources</i>	What evidence should participants provide? <i>Evidence</i>	How is achievement rewarded? <i>Rewards/Incentives/Prizes</i>
STEM <ul style="list-style-type: none"> Reasoning Inquiry Tool Use Logical/Spatial Thinking Autonomy/Initiative <ul style="list-style-type: none"> Planning Organisation Management 	Knowledge/Understanding <ul style="list-style-type: none"> Analyse Reflect Solve Evaluate Interpret 	<ul style="list-style-type: none"> 9 hours 	<ul style="list-style-type: none"> Apprentices Trainees Employees 	School <ul style="list-style-type: none"> Workshop Studio Home	Beaconing Devices <ul style="list-style-type: none"> Mobile phones/ Computer Sensors / Cyber physical System Large Display Teachers <ul style="list-style-type: none"> Face-to-face Lab tools Pen & paper 	<ul style="list-style-type: none"> Final stone geometry . 	<ul style="list-style-type: none"> Points .

Mission A

Background

Research types of power tools + the terminology used in stonemasonry, Research H+S engineering controls for power tool use. Research H+S protocol.

Skills

I Research/Standards interpreting Information

Quests: Learning tools/machine forms, engineering control and on site protocols

Time Frame	Participants	Location(s)	Resources	Evidence	Rewards	Beacons
6 hours	Students Lecturers CITB	Anywhere	Tablet/Mobile Web interface	Correctness of identification and selections		Geolocation (optional)

Mission B

Background

Students will learn to comply with the given, relevant legislation and official guidance to carry out at work and maintain safe work practices. Through the selection / mix and match user interfaces.

Skills

Adopting industry relevant, safe, and healthy working practices

Quests: Learning Stone masonry terminology, knowledge of basic waste removal techniques, knowledge of application of removal techniques into industry relevant safe and healthy working practices

Time Frame	Participants	Location(s)	Resources	Evidence	Rewards	Beacons
6 hours	Students Lecturers CITB	Anywhere	Tablet/Mobile Web interface	Correctness of identification and selections	Wildcard to hidden level; Obtain partial course credit	

Mission C

Background

Students will learn and enhance their visualization a planning skills. They will plan the cutting

Quests: knowledge of selecting and understanding of Stone, Tool Process, procedures

Time Frame	Participants	Location(s)	Resources	Evidence	Rewards	Beacons
9 hours	Students	Anywhere	Tablet/mobile			

process, require resources and sequences without performing any actual or virtual cut.

Skills
Select/quantify resources

Mission D

Background
Students will use cyber-physical game for expecting the waste removal procedure. They will perform the virtual stone cutting using the augmented grinder and the display.

Skills
Applying tools, moving, handling, using, storing, occupational safety

	Lecturers CITB	Classroom Workshop	Workstation Calculation tools Visualization tools	Results of calculations/ identifying and selecting (Errorless learning)	Options to upgrade game assets; Obtain partial course credit	
Quests: Demonstrate appropriate methods work practices processes control (HSE, protocols)						
Time Frame 19 hours	Participants Students Lecturers CITB	Location(s) Workshop	Resources Augmented waste removal tools and grinders Sensors Processing algorithms	Evidence Compliance with Standards (Errorless earning)	Rewards Tangible skills certificate; Obtain partial CREW credit	Beacons RFID

Selection			Waste Removal			Health & Safety			Health & Safety		
Blade	15	20	Positional accuracy	20	20	Dust Mask	20	20	Cleaning Dust	30	30
Cutting tool	10	20	Depth of cut accuracy	25	30	Safety glasses	20	20	Platform Height	20	30
Hand tool	10	20	Angle of cut	30	30	Helmet	20	20	Stone orientation	30	30
Chisel	10	20	Use of splays	0	10	PPE	20	20			
			Use of checks	0	10	Gloves	20	20			
excess	20	20		0	0		0	0		10	10
total	65	100		75	100		100	100		90	100
%	0.6500	1.0000		0.7500	1.0000		1.0000	1.0000		0.9000	1.0000

Parallel Score

43.875	100
0.4388	1.0000

Added Score

82.5	100
0.8250	1.0000