TLM Level 3 Award for Certified STEM Plus Toy Designer

The Certified STEM Plus Toy Designer Programme is tailored to empower educators with the expertise needed to craft engaging and educational toys for young learners in the fields of science, technology, engineering, and mathematics (STEM). Our programme is meticulously designed to equip teachers with a holistic grasp of STEM concepts and effective toy design strategies

The Regulated Qualifications Framework (RQF) was designed by the UK government's Qualifications and Curriculum Development Agency, now replaced by Ofqual. The RQF is referenced to the European Qualifications Framework devised by the European Union

The assessment model for the qualifications presented in this publication was designed by TLM in consultation with the Asian Institute of Creative Education

The Learning Machine Ltd, Unit 4D Gagarin, Lichfield Road Industrial Estate, Tamworth, Staffordshire, B79 7GN (www.theingots.org)

Table of Contents

1. For those in a hurry!

Please read the rest of the book later as the details are important!

1.1	TLM's assessment model is common to most of its qualifications. It is based on competence-based assessment of coursework using a portfolio of evidence and supported by a free optional cloud-based evidence management system.
1.2	Learners must demonstrate competence against the assessment criteria from their day-to-day work and the tutor assessor must verify that they are competent in relation to the general level descriptor using indicative assessment criteria. TLM's external moderator will check the judgements and the quality of the evidence and provide feedback. This process is not graded, the intention is that it is a flexible way of checking basic practical competence in the subject at the qualification's framework level.
Procedures	
1.3	The first thing to do is to arrange assessor training with TLM. TLM trains at least one assessor as Principal Assessor who must accept responsibility for standards within the Centre. The Principal Assessor can train and appoint assessors within the Centre as long as they are competent to take on the work and are willing to sign an agreement on the web site to uphold standards.
1.4	TLM will provide initial training in the pedagogical model using supporting technologies to provide the evidence needed. The purpose is to get you started and then we provide ongoing support to ensure you are confident and we can work as a professional partnership. We advise new Centres to do some coursework assessment early so that they can receive feedback and quickly become confident in doing routine coursework assessment. Our aim is to make this no more onerous than normal routine assessment that anyone would do as a normal part of the teaching job. This gives more time to focus on teaching and therefore to support raising attainment.

2. Introduction

The Level 3 STEM Toy Design Qualifications offer educators the chance to:

- Facilitate learning experiences that resonate with their students, fostering the development of a diverse skill set and essential personal attributes crucial for safe and effective STEM Toy Design.
- Attain a prestigious nationally recognised Level 3 certification, validating their expertise and commitment to STEM education.
- Cultivate their personal growth and deepen their engagement in the art of STEM Toy Design, ensuring they continue to inspire and guide young learners effectively.

2.1 TLM Level 3 Award for Certified STEM Plus Toy Designer

The objective of the qualification is to prepare learners with the knowledge and confidence to develop their own skills.

Mandatory - None
Level 3 Unit 1 STEM Toy Design

3. Summary of Qualification Specification

3.1 Level 3 Award (Annexe A)

The Level 3 Award is a qualification designed to enhance and develop learners' life skills and build their confidence with an engaging learning journey.

Qualification Title: TLM Level 3 Award for Certified STEM Plus Toy Designer
Qualification Number: XXXXXXX
Qualification Level: Level 3
Total Credits:3
Guided Learning Hours: 15
Total Qualification Time: 30
Assessment Methods: Coursework, E-assessment, Portfolio of Evidence

Assessment
Learners must demonstrate competence against the assessment criteria from their communication and involvement with the training materials and the trainer assessor must verify that they are competent in relation to the general level descriptor using indicative assessment criteria. TLM's external moderator will check the judgements and the quality of the evidence and provide feedback. This process is not graded, the intention is that it is a flexible way of checking basic practical competence in the subject at the qualification's framework level.
Mandatory - None
Unit 1 – STEM Toy Design (3 credits).

3.5 Assessment

The internally assessed, externally moderated coursework for all qualifications is pass/fail but by submitting the evidence for external moderation, feedback can be given to the tutor on areas to improve for resubmission.

Evidence must be provided against the unit assessment criteria from practical tasks related to the learners' everyday work supported by tutor observations, portfolio completed, and or activities in line with the learning materials

The way evidence is gathered is up to the assessor, the only requirement is that it clearly supports the judgements against the assessment criteria and the relevant learning outcomes.

If, on formative assessment, the account manager finds gaps in evidence relating to a particular candidate, they will request more evidence before approving the award or the unit certificate. Assessors must then adjust their work to ensure all their learners are providing the appropriate level and breadth of evidence.

We encourage early submission of at least some evidence so that assessors are confident from the feedback that what they are providing is sufficient. In this way we can maintain standards while supporting improved efficiency.

Centres will be subject to the TLM Centre Assessment Standards Scrutiny (CASS) and further details of this, including our centre guidance, is freely available on the TLM website in our Policy Download Centre. https://tlm.org.uk/policy-download-centre/

4. Qualification Content

Mandatory	Optional Unit Bank
XCREDITS	
Level 3 Unit 1 – STEM Toy Design	None

5. Support

	Guidance and Assistance
5.1	There is further guidance for coursework assessment on the TLM web site. All centres have an assigned Account Manager who will be pleased to help at any time. Our aim is to give professional assessors, most of whom are qualified tutors, the confidence to make judgements with a minimum of bureaucracy so that they can focus their time on maintaining their professional knowledge, skills and supporting learning through effective teaching rather than “chasing paper”. There is often a confusion between bureaucracy and rigour, since unnecessarily complex bureaucracy can actually detract from rigour by obscuring the importance of the outcomes.
5.2	**Web sites** - TLM provides support through cloud-based systems. Providing assessment grades and the management of certification through the Markbook Site is mandatory and all assessors are provided with training in its use. It is simply a matter of recording learner competence against the unit criteria as the evidence is collected and claiming a certificate on behalf of the learner when a unit has been fully assessed.
5.3	The **community learning site** provides free optional facilities for learners to submit their evidence on-line, linking it to the assessment criteria across single or multiple units. The assessor can accept or reject this evidence and comment on it providing a full audit trail for evidence. Moderators/verifiers can get immediate access to this evidence and so it is potentially a lot more efficient than alternative methods. No paper, no emails with file attachments necessary. There are facilities for progress tracking that can be based on criteria and/or units. The system can be linked as an extension to any standards compliant VLE/e-portfolio system for centres that are already committed to a specific VLE product. Training can be provided, and free support is available from your Account Manager. The aim is to eliminate all paper-based bureaucracy, all screen-shots and referencing that draws time away from teaching.
5.4	**Telephone** and email support are available to all Centres. There is a general convention of firstname.secondname@tlm.org.uk for email addresses. It is usually best to email your account manager in the first instance. Google hangouts can be arranged for video conferencing support.

6. Registration & Procedures

	Registration
6.1	TLM's registration model allows centres to enter learners at times convenient to them. There are no late entry fees and no additional fees should a learner fail to produce evidence at a level but can meet the criteria at a lower level. This can reduce costs to the centres when compared to other qualifications There are no fees for replacement certificates or verification of certificates because all certificates can be directly authenticated against TLM's secure database. For details of current subscription costs please contact us or refer to the web site.
	Internal standardisation
6.2	The Principal Assessor has the ultimate responsibility for consistency in assessment standards within a centre. All assessors have signed a contract agreeing to uphold standards and should therefore co-operate with the Principal Assessor and Account Manager at TLM to ensure that standards across the centre are consistent. It is advisable to send work samples to TLM early to check that evidence is at the right standard so that there is time to make any adjustments necessary to the course and learner expectations. TLM will generally check a higher quantity of work from new assessors and feedback to ensure that they are confident to make appropriate judgements over time. This reduces risk and improves efficiency in the longer term.
	Authentication
6.3	All assessors must take reasonable steps to ensure that any coursework evidence submitted by candidates is a true reflection of the candidates' competence. This is in keeping with the assessor undertaking to uphold and maintain standards in the contract with TLM.
6.4	Certificates can be authenticated directly on-line using the certificate number or by scanning the QR code on the certificate. There is no charge and it makes it more likely that certificates will be checked and that in turn improves security. Certificate forgeries are a significant problem when authentication is not simple and straightforward because convincing forgeries are easy to achieve with recent technologies and will get easier as time goes on.

7. Other Considerations

	Access arrangements and special requirements
7.1	All TLM's qualifications are intended to be accessible, as widely as possible. Please refer to the Annex for further information. Centres should contact TLM if they have any questions related to accessibility issues
	Language
7.2	The language for provision of this qualification is English only. This will only change if we have a significant demand in another language that is sufficient to cover the additional costs involved.
	Malpractice
7.3	TLM has comprehensive policies and procedures for dealing with malpractice. These are documented with links on the web site at https://tlm.org.uk/policy-download-centre/ Assessors should be familiar with these policies and make them clear to candidates. Assessors should inform their account manager if they suspect any instance of malpractice that could have a material effect on the outcome of any assessments, either for themselves or colleagues. This is part of the upholding of standards that is part of the contract with TLM.
	Equality of opportunity
7.4	TLM promotes equality of opportunity through policies and procedures. These are again documented in detail on the web site at https://tlm.org.uk/policy-download-centre/
	Resources, Support and Training
7.5	A clear goal is to enable learners to support all their IT user needs using resources freely and legally available from the internet. This is related directly to national policies for inclusion and equality of opportunity. The reality is that there is so much user dependence on proprietary applications that we can only support the transition to free and open resources through education and common sense.
7.6	TLM does not require centres to use Free and Open-Source applications but it certainly encourages them to do so. Most of the key software applications needed to support any of the assessed units are available freely from the web including office suites, graphics and sound editing. As a nation we could save hundreds of millions if not billions of pounds in software licensing fees by providing users with the skills, knowledge and confidence to migrate to free and open-source applications. YouTube, OpenClipart.org, Wikipedia and many other sites provide free content that supports learning and the number and range of such sites is increasing.

Annexe A

Level 3 Award for Certified STEM Plus Toy Designer - Unit assessment - coursework guidance

The Level 3 learner has knowledge and understanding of facts, procedures and ideas in an area of study or field of work to complete well-defined tasks and address straightforward problems. Holder can interpret relevant information and ideas. Holder is aware of a range of information that is relevant to the area of study or work. AND/OR Holder can select and use relevant cognitive and practical skills to complete well-defined, generally routine tasks and address straightforward problems. Holder can identify how effective actions have been. Holder can identify, gather and use relevant information to inform actions.	Moderation/verification: The assessor should keep a record of assessment judgements made for each candidate and make notes of any significant issues for any candidate. They must be prepared to enter into dialogue with their Account Manager and provide their assessment records to the Account Manager through the on-line mark book. They should be prepared to provide evidence as a basis for their judgements should it be required by the Principal Assessor or their Account Manager/external moderator. Before authorising certification, the Account Manager must be satisfied that the assessor's judgements are sound.

General Information

The Level 3 qualification has the following characteristics for learners:

- Achievement at RQF level 3 (EQF Level 4) reflects the ability to select and use relevant knowledge, ideas, skills and procedures to complete well-defined tasks and address straightforward problems. It includes taking responsibility for completing tasks and procedures and exercising autonomy and judgement subject to overall direction or guidance.
- Use understanding of facts, procedures and ideas to complete well-defined tasks and address straightforward problems. Interpret relevant information and ideas. Be aware of the types of information that are relevant to the area of study or work.
- Complete well-defined, generally routine tasks and address straightforward problems. Select and use relevant skills and procedures. Identify, gather and use relevant information to inform actions. Identify how effective actions have been.
- Take responsibility for completing tasks and procedures subject to direction or guidance as needed.

- The specification for the Level 3 Award provides an outcome framework for assessment and is not intended to dictate any particular context for learning and so can be used with any age range of adults.

Requirements

- Standards must be confirmed by a trained Level 3 Assessor
- Assessors must as a minimum record assessment judgement as entries in the on-line mark book on the TLM certification site.
- It is expected that there will be routine evidence of work used for judging assessment outcomes in the candidates' records of their day-to-day work. Samples, including related plans and schemes of work should be available at the annual visit and/or by video conference.
- Different approaches to learning will be required in order to match differing needs, for example, the needs of learners will be different from the needs of those with learning disabilities.
- When the candidate demonstrates secure capability against each of the criteria in the unit, they are entitled to a certificate for passing the unit and the overall award.
- We expect at least 7 hours of guided study to be under-taken for the certificate for complete beginners generally new to formal education, but discretion can be used to take account of prior learning where this is sensible in individual cases. In terms of making the certificate, what matters is outcomes. Can the candidate securely meet the criteria?

Level 3, Unit 1 – STEM Toy Design

1. Understand STEM Toy Design	2. Foundations of STEM Education	3. Designing STEM Toys
1.1 I can explain the purpose and objectives of the STEM toy designing programme	2.1 I can define STEM education and its significance in contemporary learning	3.1 I can conceptualise and describe the principles of effective STEM toy design.
1.2 I can analyse the essential knowledge required for effective STEM toy design	2.2 I can explore the advantages of STEM education for learners.	3.2 I can demonstrate the ability to apply STEM concepts in designing toys
1.3 I can identify the critical skills necessary for successful STEM toy design.	2.3 I can describe the benefits of “learning through play” for STEM learners at this age group	3.3 I can evaluate the safety, durability and educational value of STEM toy designs.
1.4. I can describe the behaviours and qualities of a proficient STEM toy designer	2.4 I can describe how to adapt STEM education for different ages groups	3.4 I can explain how assessment arrangements can be adapted to meet the needs of individual learners
		3.5 I can communicate the rationale behind the design choices made for STEM toys and their relevance to STEM education.

Teacher Guidance Notes

Understand STEM Toy Design

1.1 I can explain the purpose and objectives of the STEM toy designing programme

As a teacher facilitating this module, your role is to ensure that students understand the purpose and goals of STEM toy design for young learners. Emphasise the importance of creating toys that stimulate curiosity, problem-solving skills and a love for STEM subjects among children. Guide students to recognise that the primary objective is to design toys that are both fun and educational. Encourage discussion and critical thinking about how their designs can achieve these goals.

1.2 I can analyse the essential knowledge required for effective STEM toy design

In this section you will help students develop the foundational knowledge and skills required for effective STEM toy design. Here's a breakdown of what to cover:

- Understanding STEM Concepts: Ensure students have a solid grasp of fundamental STEM concepts relevant to their toy designs. Provide resources and support for them to explore scientific principles, mathematical concepts, and basic engineering principles related to their projects.
- Child Development: Familiarise students with the cognitive, social, and emotional development stages of the age group for which they are designing toys (e.g. 4 to 6 year olds for Entry 1). Discuss how these developmental stages should influence their design choices.
- Age-appropriate Curriculum: Introduce students to age-appropriate STEM curriculum and resources that align with the objectives of their toy designs. Encourage them to research and select materials that suit the learning needs and abilities of their target age group.
- Safety Considerations: Stress the importance of safety protocols when designing toys for young children. Provide guidelines on selecting materials and designs that are safe for the specified age range. Emphasise the need for non-toxic, durable, and age-appropriate components.
- Project-based Learning: Explain the concept of project-based learning and how it can be applied to STEM toy design. Encourage students to think about hands-on activities or experiments that can be integrated into their toy designs to promote active learning and engagement.

1.3 I can identify the critical skills necessary for successful STEM toy design

This section focuses on nurturing creativity in students' STEM toy designs. Here's how to guide them:

- Brainstorming and Idea Generation: Encourage students to engage in brainstorming sessions to generate innovative ideas for their STEM toys. Teach them techniques for creative thinking and idea generation.
- Prototyping and Iteration: Explain the importance of prototyping and iterative design in the creative process. Guide students in creating initial prototypes of their toy designs and emphasise the need for refinement based on testing and feedback.
- Incorporating Art and Design Elements: Highlight the role of aesthetics in toy design. Discuss how to incorporate visual appeal and design elements that engage and captivate young learners.

1.4 I can describe the behaviours and qualities of a proficient STEM toy designer

In this section, you'll help students develop communication and presentation skills for sharing their STEM toy designs:

- Effective Communication: Teach students how to effectively communicate their design ideas, principles, and objectives to their peers and potential users. Emphasise clear and concise communication.
- Presentation Techniques: Provide guidance on creating engaging presentations to showcase their STEM toy designs. Encourage the use of visuals, storytelling, and persuasive communication to convey the educational value of their toys.
- Receiving and Incorporating Feedback: Explain the importance of receiving feedback gracefully and using it to improve their designs. Encourage a culture of constructive criticism and collaboration among students.

2: Foundations of STEM Education

2.1 I can define STEM education and its significance in contemporary learning

Your role as a teacher in this module is to ensure that students gain a comprehensive understanding of STEM education. Here's how you can guide them:

- Defining STEM Education: Start by defining what STEM education encompasses by emphasising the integration of science, technology, engineering, and mathematics. Provide historical context and examples to illustrate its significance.
- Exploring STEM Disciplines: Encourage students to explore each STEM discipline (science, technology, engineering, and mathematics) and how they intersect within STEM education. Discuss the real-world applications of these disciplines.
- STEM in Everyday Life: Highlight how STEM principles are present in everyday life, from technological innovations to scientific discoveries. Engage students in discussions about the relevance of STEM in society.

2.2 I can explore the advantages of STEM education for learners

This section focuses on conveying the advantages of STEM education to young learners. Here's how to guide students:

- Improved Problem-Solving Skills: Discuss how STEM education enhances problem-solving abilities by encouraging critical thinking and analytical skills.
- Fostering Creativity: Explain how STEM education promotes creativity by encouraging students to explore innovative solutions and think outside the box.
- Career Opportunities: Discuss the wide range of career opportunities available to individuals with STEM skills, emphasising the potential for a bright future in STEM related fields.

2.3 I can describe the benefits of “learning through play” for STEM learners at this age group:

In this section, you'll explore the benefits of incorporating "learning through play" in STEM education:

- Understanding Play-Based Learning: Define play-based learning and its importance in early childhood education. Discuss how it aligns with STEM principles and encourages active engagement.
- Enhancing Cognitive Development: Explain how play-based learning in STEM education can enhance cognitive development, including problem-solving, spatial awareness, and mathematical thinking.
- Hands-On Activities: Provide examples of hands-on activities that utilise play-based learning to teach STEM concepts. Encourage students to think creatively about designing such activities for young learners.

2.4 I can describe how to adapt STEM education for different ages groups:

This section focuses on tailoring STEM education to suit different age groups:

- Age-appropriate Content: Emphasise the importance of adapting STEM content to match the developmental stage and cognitive abilities of the learners.
- Engaging Young Learners: Discuss strategies for engaging young children (e.g. 4 to 6 year olds) in STEM activities such as storytelling, interactive games, and simple experiments.
- Challenges for Older Learners: Explore the unique challenges and opportunities in delivering STEM education to older age groups (e.g. 14 to 16 year olds). Discuss how to make advanced STEM concepts relevant and engaging.

3: Designing STEM Toys

3.1 I can conceptualise and describe the principles of effective STEM toy design

As a teacher guiding this module, your role is to help students conceptualise effective STEM toys. Here's how you can guide them:

- Understanding Learning Objectives: Ensure students comprehend the learning objectives of their STEM toy designs. Discuss how these objectives should align with age-appropriate educational goals.
- Creativity in Design: Encourage creative thinking and brainstorming to generate innovative ideas for STEM toys. Emphasise the importance of toys that stimulate curiosity, critical thinking, and problem-solving skills.
- Integration of STEM Concepts: Guide students in integrating STEM concepts into their toy designs. Encourage them to consider how their designs can make science, technology, engineering, and mathematics engaging and accessible.

3.2 I can demonstrate the ability to apply STEM concepts in designing toys

In this section you'll focus on the hands-on aspect of STEM toy design by:

- Building Prototypes: Teach students how to create prototypes of their STEM toys. Emphasise the iterative design process, where they can refine their prototypes based on testing and feedback.
- Incorporating Hands-On Activities: Discuss the importance of including interactive, hands-on activities or experiments in their toy designs. Encourage students to think creatively about how these activities can convey STEM concepts.
- Learning by Doing: Highlight the principle of "learning by doing" in STEM toy design. Explain how hands-on experiences can deepen children's understanding of STEM subjects.

3.3 I can evaluate the safety, durability, and educational value of STEM toy designs

In this section, you'll address safety and durability considerations.

- Safety Protocols: Stress the importance of safety guidelines when designing toys for young children. Provide guidance on selecting materials and designs that are safe for the specified age range.
- Durability and Quality: Discuss the need for durable and high-quality materials in STEM toy design. Encourage students to consider the longevity of their designs and their potential for repeated use.
- Age-Appropriate Components: Emphasise the selection of age-appropriate components and materials to ensure the safety and suitability of the toys for the designated age group.

3.4 I can explain how assessment arrangements can be adapted to meet the needs of individual learners

In this section you'll help students effectively communicate the rationale behind their toy designs.

- Presenting the Educational Value: Guide students in presenting the educational value of their STEM toys. Encourage them to explain how their designs support STEM learning and development.
- Clear Documentation: Stress the importance of clear and concise documentation of their design process. Encourage students to maintain records of their design choices and iterations.
- User-Centred Approach: Discuss the significance of a user-centred approach in design. Encourage students to consider the needs and preferences of both young learners and educators.

3.5 I can communicate the rationale behind the design choices made for STEM toys and their relevance to STEM education

Your role as a teacher is to guide students in explaining the reasons behind their STEM toy design choices and how they relate to STEM education.

- Educational Alignment: Students should clarify how each aspect of their toy design, such as materials and activities, serves a specific educational goal in STEM.
- Learning Outcomes: Encourage students to connect their design choices to intended learning outcomes, demonstrating how their toy supports skills like problem-solving and critical thinking.

User-Centred Approach: Stress the importance of explaining how their design enhances the learning experience for young users.

- Addressing Challenges: Encourage students to acknowledge potential challenges and discuss solutions or adaptations.
- Real-World Relevance: Help students connect their toy designs to real-world applications, showing how STEM concepts are used in everyday life.

Accessibility Policies

TLM firmly believes that every learner should have an equal chance to excel in their studies and assessments, regardless of any disabilities they may have. To achieve this goal, TLM has developed a comprehensive and well-structured reasonable adjustment policy that is specifically tailored to cater to the needs of learners with disabilities. This policy is not only an essential aspect of TLM's commitment to inclusivity but also an integral part of creating a diverse and accessible learning environment.

The reasonable adjustment policy is designed to support learners with disabilities in various ways. It encompasses a range of accommodations, such as providing additional time for examinations, offering alternative formats for study materials, permitting the use of assistive technology, arranging for sign language interpreters, and ensuring accessible physical facilities. The implementation of these reasonable adjustments is meticulously carried out to ensure that they meet the individual needs of each learner, acknowledging the unique challenges they may face.

TLM is dedicated to making the reasonable adjustment process transparent and easily accessible for all stakeholders. Thus, the details of the policy are made readily available to all, including learners, educators, and TLM Centres. These details can be found on TLM's official website, ensuring that everyone is well-informed about the support and accommodations available to learners with disabilities.

Additionally, TLM Centres play a crucial role in facilitating this process. They are empowered to submit requests for other reasonable adjustments on behalf of learners, based on their specific requirements and circumstances.

TLM firmly believes that promoting a culture of inclusivity and understanding is fundamental to fostering an environment where learners can thrive, irrespective of their abilities or disabilities. By continuously evaluating and refining its reasonable adjustment policy, TLM ensures that it remains up-to-date with the best practices in the field of inclusive education.

TLM Qualifications is deeply committed to its duty as an awarding organisation to provide reasonable adjustments for learners with disabilities in accordance with the Equality Act 2010. By adhering to its comprehensive reasonable adjustment policy and collaborating closely with TLM Centres, TLM strives to create a learning landscape that supports and empowers all learners, ensuring they can reach their full potential and achieve academic success

TLM Accessibility Policy: https://tlm.org.uk/policies/general-requirements-for-regulated-qualifications/#3

TLM reasonable adjustment policy: https://tlm.org.uk/reasonable-adjustments-and-special-considerations-policy-2/

TLM reasonable adjustments request form: https://tlm.org.uk/wp-content/uploads/2022/03/TLM-RASC-form-1.docx

TLM reasonable adjustments request form: https://tlm.org.uk/wp-content/uploads/2022/03/TLM-RASC-form-1.docx