

CREATIVE ARTS AND FASHION

# 3D Digital Game Art



## Technical Description

WorldSkills International, by a resolution of the Competitions Committee and in accordance with the Constitution, the Standing Orders, and the Competition Rules, has adopted the following minimum requirements for this skill for the WorldSkills Competition.

The Technical Description consists of the following:

<b>1 Introduction .....</b>	<b>2</b>
<b>2 The WorldSkills Occupational Standards (WSOS).....</b>	<b>4</b>
<b>3 The Assessment Strategy and Specification.....</b>	<b>9</b>
<b>4 The Marking Scheme .....</b>	<b>10</b>
<b>5 The Test Project.....</b>	<b>13</b>
<b>6 Skill management and communication .....</b>	<b>16</b>
<b>7 Skill-specific safety requirements.....</b>	<b>18</b>
<b>8 Materials and equipment.....</b>	<b>19</b>
<b>9 Skill-specific rules.....</b>	<b>21</b>
<b>10 Visitor and media engagement .....</b>	<b>23</b>
<b>11 Sustainability .....</b>	<b>24</b>
<b>12 References for industry consultation.....</b>	<b>25</b>

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# 1 Introduction

## 1.1 Name and description of the skill competition

### 1.1.1 The name of the skill competition is

3D Digital Game Art

### 1.1.2 Description of the associated work role(s) or occupation(s).

The games development sector comprises three occupations or work roles: the designer, the artist, and the programmer. The 3D Digital Game Artist takes a designer's brief and, through a combination of conceptualization, creativity, selectivity, technical, and specialist skills, completes the brief to the satisfaction of clients. The 3D Digital Game Artist receives, conceptualizes, and interprets design briefs on the basis of their market knowledge and skill sets, and the given scope and limits of the briefs. The skills required of the 3D Digital Game Artist can be broken down further into 2D concept art, texture painting, 3D modelling, rigging, and animating.

After interpreting a brief, the 3D Digital Game Artist must produce a 2D digital concept of the required assets for the game, which could include objects, characters, and environments. This requires the development of good silhouettes enabling the designs can be recognized immediately without detail, with greyscale values that highlight the important details of an asset, in order to define a colour scheme based on the Artist's knowledge of colour balance, saturation, and mixing.

The 3D Digital Game Artist must then produce a 3D mesh of the asset, making decisions for geometry, triangle count, symmetry, and silhouette, and modelling the edgeflow. UV unwrapping is used to flatten a 3D model into a 2D set of shells that a texture can be painted onto. This requires the ability to assign enough 3D mesh from the model for the model to render enough detail. The placement of the UV shells is a meticulous job. Artefacts must take into account the bleeding effect of colour on smaller versions of textures dependent on hardware, so these shells should be grouped by base colour.

Textures are then produced to create materials that may be applied to the 3D model, taking into account the colours, secularity, and opacity of various parts of a model. Some textures are painted by hand; some require the use of photographic references and others require a digital process to calculate ambient occlusion and normal maps for shadows and detail. Next, the model may be rigged with bones in the 3D software in order to animate it either in the 3D software or the games engine.

An artist may work in a team led by an Art Lead or Director, or in small companies with a programmer and designer. Artists may work in open areas for creative sharing, or in isolation on a strictly confidential basis.

Despite tremendous growth in the sector, the 3D Digital Game Artist's role has evolved and split into specialisms, but otherwise remained constant, with an ongoing appreciation of aesthetics, colour, structure, and form as well as movement. The best artists are able to lead art teams solving visual errors and producing assets that operate on the fringes of the available technology to achieve the most absorbing experiences possible in a videogame.

### 1.1.3 Number of Competitors per team

3D Digital Game Art is a single Competitor skill competition.

### 1.1.4 Age limit of Competitors

The Competitors must not be older than 22 years in the year of the Competition.

#### **UPDATE FOR WSC2022 ONLY**

Competitors must not be older than 23 years in the calendar year of the Competition.

## 1.2 The relevance and significance of this document

This document contains information about the standards required to compete in this skill competition, and the assessment principles, methods and procedures that govern the competition.

Every Expert and Competitor must know and understand this Technical Description.

In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

## 1.3 Associated documents

Since this Technical Description contains only skill-specific information it must be used in association with the following:

- WSI – Code of Ethics and Conduct
- WSI – Competition Rules
- WSI – WorldSkills Occupational Standards framework
- WSI – WorldSkills Assessment Strategy
- WSI online resources as indicated in this document
- WorldSkills Health, Safety, and Environment Policy and Regulations.

## 2 The WorldSkills Occupational Standards (WSOS)

### 2.1 General notes on the WSOS

The WSOS specifies the knowledge, understanding, and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business ([www.worldskills.org/WSOS](http://www.worldskills.org/WSOS)).

The skill competition is intended to reflect international best practice as described by the WSOS, and to the extent that it is able to. The Standard is therefore a guide to the required training and preparation for the skill competition.

In the skill competition the assessment of knowledge and understanding will take place through the assessment of performance. There will only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

The Standard is divided into distinct sections with headings and reference numbers added.

Each section is assigned a percentage of the total marks to indicate its relative importance within the Standards. This is often referred to as the “weighting”. The sum of all the percentage marks is 100. The weightings determine the distribution of marks within the Marking Scheme.

Through the Test Project, the Marking Scheme will assess only those skills that are set out in the Standards Specification. They will reflect the Standards as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme will follow the allocation of marks within the Standards to the extent practically possible. A variation of up to five percent is allowed, provided that this does not distort the weightings assigned by the Standards.

## 2.2 WorldSkills Occupational Standards

<b>1</b>	<b>Work Organization and management</b>	<b>5</b>
<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> <li>• Regulations and requirements for safe working practices</li> <li>• Terminology specific to the sector and role</li> <li>• How to plan for and manage time and tasks</li> <li>• The importance of making regular backups of work to avoid file corruption</li> <li>• File management and structure for interpretation by the team and for optimal use when transferring between hardware</li> </ul> <hr/> <p>The individual shall be able to:</p> <ul style="list-style-type: none"> <li>• Conform to professional standards at all times</li> <li>• Take responsibility for all production processes</li> <li>• Set-up and maintain file structures and naming conventions</li> <li>• Manage their own time</li> <li>• Recover from setbacks</li> <li>• Communicate and work with others for the common benefit</li> </ul>		
<b>2</b>	<b>Interpretation of the design brief</b>	<b>6</b>
<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> <li>• The 3D digital game market</li> <li>• Art styles and how to read and work to a particular set style</li> <li>• Platform specifications and the restrictions and opportunity they afford to polygon counts and texture sizes.</li> <li>• Asset list priorities to determine what are the most important assets to spend time on and what can utilize duplication/re-use.</li> </ul> <hr/> <p>The individual shall be able to:</p> <ul style="list-style-type: none"> <li>• Conform to the art style, colours, and themes</li> <li>• Select appropriate approaches based on platform, genre, audience, and game type.</li> <li>• Produce asset lists and determine timescales, polycounts, and texture sizes</li> </ul>		
<b>3</b>	<b>Concept art</b>	<b>12</b>
<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> <li>• The creation of silhouettes of objects and characters to portray shape, mood, mass, and movement.</li> <li>• Values of greyscale to draw viewers' attention to important aspects of the asset</li> <li>• Colour theory for choosing base colours, secondary, mixing, and balance.</li> </ul>		

The individual shall be able to:

- Digitally paint to demonstrate form, line, shading, perspective, proportion, light, and shadow.
- Use digital techniques to produce appropriate effects and make efficient use of time
- Choose appropriate software to paint concept art pieces in with maximum production in the swiftest time
- Review and select each piece of concept art to inform the look of finished 3D models

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#### **4 3D Modelling**

**28**

The individual needs to know and understand:

- Geometric principles in determining how to build the assets
- Symmetry in creating a base model that allows for efficient use of materials later on in the process.
- Polygon counts that are proportional to detail and focus on the asset/s.
- Edgeflow that evenly distributes vertex points over models for a balanced texel density and even silhouette.

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The individual shall be able to:

- Select appropriate 3D modelling software to begin models, e.g. 3DS Max or Maya for hard surface modelling, or a sculpting tool like ZBrush for organic sculpts.
- Utilize skills in sculpting, edge modelling, or box modelling to produce the basic form of models
- Use tools and modifiers to create further details on models
- Constantly review models from all angles to determine refinements, improvements, and additional detail
- Use optimization techniques on the models

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#### **5 UV unwrapping**

**10**

The individual needs to know and understand:

- Mirroring shells to maximize texture space and texel density.
- Equitable proportions for important sections of assets.
- The spacing of shells that maximizes the usage of texture sheets while avoiding colour bleeding between shells
- The grouping of shells by colour to further avoid colour bleeding

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The individual shall be able to:

- Use UV unwrapping tools to project maps on to all the surfaces of 3D assets  
Separate surfaces into appropriate shells to flatten over the UV space.
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- Organize shells to make the most of space
- Group shells with similar colours together
- Export UV coordinates to texture tools or painting software
- Bake UV from 3D assets

## 6 Texturing

20

The individual needs to know and understand:

- How to paint colour and details to represent a variety of physical materials like wood, plastic, metal, and fabrics
- Diffuse colour maps that represent the base colours of materials
- Specular maps that represent shine in order to produce realistic metal, plastic, or wet and oily surfaces.
- Opacity maps that use alpha maps to produce complex objects on a 3D flat plane, e.g. grass, hair, branches, wire.
- Normal maps and the production of high-resolution models, to project, using cages onto low resolution models
- Ambient occlusion that uses the 3D information to render shadows onto flat texture based on the proximity of polygons

The individual shall be able to:

- Select an appropriate piece of software to produce textures and materials e.g. Photoshop and Substance Designer
- Paint a variety of physical materials and adapt to the art style set out in the brief (e.g. hand-painted and/or PBR)
- Paint or engineer specular maps for controlling shine and glossiness of surfaces
- Paint opacity maps, as required, to handle complex objects or sections of assets
- Export a variety of maps (normal, specular, ambient occlusion etc) from appropriate pieces of software and import into the preferred 3D software

## 7 Rigging

13

The individual needs to know and understand:

- The purposes and construction of bones to move 3D models in a games engine
- Forward kinematics and inverse kinematics
- The tool to set up appropriate IK chains with relevant constraints.
- The purposes of skinning, and methods for skinning a model

- The purposes of key frame animation
- How to make animation into the asset

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The individual shall be able to:

- Create an appropriate bone structure to form a working rig for the in-game asset.
- Set up a parent child structure for FK or IK chain.
- Skin the mesh and paint how the bones influence the 3D model.
- Set simple animation keys to test the motion of the asset in an engine

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<b>7</b>	<b>Export to game engine</b>		<b>6</b>
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The individual needs to know and understand:

- How to utilize material shaders and lighting to represent assets and their most important aspects.
- The correct set up for export files to import them to game engines
- The options for importing files, based on the selected game engines
- How to test the asset once in a game engine

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The individual shall be able to:

- Choose and use a renderer, pose the object, and select appropriate lighting and settings to highlight the best qualities of the asset
- Export 3D models and rig/animation into a games engine.
- Select an appropriate game engine and test the asset for model, UV, and deformation errors.

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	<b>Total</b>		<b>100</b>
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## 3 The Assessment Strategy and Specification

### 3.1 General guidance

Assessment is governed by the WorldSkills Assessment Strategy. The Strategy establishes the principles and techniques to which WorldSkills assessment and marking must conform.

Expert assessment practice lies at the heart of the WorldSkills Competition. For this reason, it is the subject of continuing professional development and scrutiny. The growth of expertise in assessment will inform the future use and direction of the main assessment instruments used by the WorldSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the WorldSkills Competition falls into two broad types: measurement and judgement. For both types of assessment, the use of explicit benchmarks against which to assess each Aspect is essential to guarantee quality.

The Marking Scheme must follow the weightings within the Standards. The Test Project is the assessment vehicle for the skill competition, and therefore also follows the Standards. The CIS enables the timely and accurate recording of marks; its capacity for scrutiny, support, and feedback is continuously expanding.

The Marking Scheme, in outline, will lead the process of Test Project design. After this, the Marking Scheme and Test Project will be designed, developed, and verified through an iterative process, to ensure that both together optimize their relationship with the Standards and the Assessment Strategy. They will be agreed by the Experts and submitted to WSI for approval together, in order to demonstrate their quality and conformity with the Standards.

Prior to submission for approval to WSI, the Marking Scheme and Test Project will liaise with the WSI Skill Advisors for quality assurance and to benefit from the capabilities of the CIS.

## 4 The Marking Scheme

### 4.1 General guidance

This section describes the role and place of the Marking Scheme, how the Experts will assess Competitors' work as demonstrated through the Test Project, and the procedures and requirements for marking.

The Marking Scheme is the pivotal instrument of the WorldSkills Competition, in that it ties assessment to the standard that represents each skill competition, which itself represents a global occupation. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards.

By reflecting the weightings in the Standards, the Marking Scheme establishes the parameters for the design of the Test Project. Depending on the nature of the skill competition and its assessment needs, it may initially be appropriate to develop the Marking Scheme in more detail as a guide for Test Project design. Alternatively, initial Test Project design can be based on the outline Marking Scheme. From this point onwards the Marking Scheme and Test Project should be developed together.

Section 2.1 above indicates the extent to which the Marking Scheme and Test Project may diverge from the weightings given in the Standards, if there is no practicable alternative.

For integrity and fairness, the Marking Scheme and Test Project are increasingly designed and developed by one or more independent people with relevant expertise. In these instances, the Marking Scheme and Test Project are unseen by Experts until immediately before the start of the skill competition, or competition module. Where the detailed and final Marking Scheme and Test Project are designed by Experts, they must be approved by the whole Expert group prior to submission for independent validation and quality assurance. Please see the Rules for further details.

Experts and Independent Assessors are required to submit their Marking Schemes and Test Projects for review, verification, and validation well in advance of completion. They are also expected to work with their Skill Advisor, reviewers, and verifiers, throughout the design and development process, for quality assurance and in order to take full advantage of the CIS's features.

In all cases a draft Marking Scheme must be entered into the CIS at least eight weeks prior to the Competition. Skill Advisors actively facilitate this process.

### 4.2 Assessment Criteria

The main headings of the Marking Scheme are the Assessment Criteria. These headings are derived before, or in conjunction with, the Test Project. In some skill competitions the Assessment Criteria may be similar to the section headings in the Standards; in others they may be different. There will normally be between five and nine Assessment Criteria. Whether or not the headings match, the Marking Scheme as a whole must reflect the weightings in the Standards.

Assessment Criteria are created by the person or people developing the Marking Scheme, who are free to define the Criteria that they consider most suited to the assessment and marking of the Test Project. Each Assessment Criterion is defined by a letter (A-I). *The Assessment Criteria, the allocation of marks, and the assessment methods, should not be set out within this Technical Description. This is because the Criteria, allocation of marks, and assessment methods all depend on the nature of the Marking Scheme and Test Project, which is decided after this Technical Description is published.*

The Mark Summary Form generated by the CIS will comprise a list of the Assessment Criteria and Sub Criteria.

The marks allocated to each Criterion will be calculated by the CIS. These will be the cumulative sum of marks given to each Aspect within that Assessment Criterion.

### 4.3 Sub Criteria

Each Assessment Criterion is divided into one or more Sub Criteria. Each Sub Criterion becomes the heading for a WorldSkills marking form. Each marking form (Sub Criterion) contains Aspects to be assessed and marked by measurement or judgement, or both measurement and judgement.

Each marking form (Sub Criterion) specifies both the day on which it will be marked, and the identity of the marking team.

### 4.4 Aspects

Each Aspect defines, in detail, a single item to be assessed and marked, together with the marks, and detailed descriptors or instructions as a guide to marking. Each Aspect is assessed either by measurement or by judgement.

The marking form lists, in detail, every Aspect to be marked together with the mark allocated to it. The sum of the marks allocated to each Aspect must fall within the range of marks specified for that section of the Standards. This will be displayed in the Mark Allocation Table of the CIS, in the following format, when the Marking Scheme is reviewed from C-8 weeks. (Section 4.1 refers.)

	CRITERIA								TOTAL MARKS PER SECTION	WSSS MARKS PER SECTION	VARIANCE	
	A	B	C	D	E	F	G	H				
STANDARDS SPECIFICATION SECTION												
1	5.00								5.00	5.00	0.00	
2		2.00					7.50		9.50	10.00	0.50	
3								11.00	11.00	10.00	1.00	
4			5.00						5.00	5.00	0.00	
5				10.00	10.00	10.00			30.00	30.00	0.00	
6		8.00	5.00				2.50	9.00	24.50	25.00	0.50	
7			10.00				5.00		15.00	15.00	0.00	
TOTAL MARKS	5.00	10.00	20.00	10.00	10.00	10.00	15.00	20.00	100.00	100.00	2.00	

### 4.5 Assessment and marking

There is to be one marking team for each Sub Criterion, whether it is assessed and marked by judgement, measurement, or both. The same marking team must assess and mark all Competitors.

Where this is impracticable (for example where an action must be done by every Competitor simultaneously, and must be observed doing so), a second tier of assessment and marking will be put in place, with the approval of the Competitions Committee Management Team. The marking teams must be organized to ensure that there is no compatriot marking in any circumstances. (Section 4.6 refers.)

## 4.6 Assessment and marking using judgement

Judgement uses a scale of 0-3. To apply the scale with rigour and consistency, judgement must be conducted using:

- benchmarks (criteria) for detailed guidance for each Aspect (in words, images, artefacts or separate guidance notes)
- the 0-3 scale to indicate:
  - 0: performance below industry standard
  - 1: performance meets industry standard
  - 2: performance meets and, in specific respects, exceeds industry standard
  - 3: performance wholly exceeds industry standard and is judged as excellent

Three Experts will judge each Aspect, normally simultaneously, and record their scores. A fourth Expert coordinates and supervises the scoring, and checks their validity. They also act as a judge when required to prevent compatriot marking.

## 4.7 Assessment and marking using measurement

Normally three Experts will be used to assess each aspect, with a fourth Expert supervising. In some circumstances the team may organize itself as two pairs, for dual marking. Unless otherwise stated, only the maximum mark or zero will be awarded. Where they are used, the benchmarks for awarding partial marks will be clearly defined within the Aspect. To avoid errors in calculation or transmission, the CIS provides a large number of automated calculation options, the use of which is mandated.

## 4.8 The use of measurement and judgement

Decisions regarding the choice of criteria and assessment methods will be made during the design of the competition through the Marking Scheme and Test Project.

## 4.9 Skill assessment strategy

WorldSkills is committed to continuous improvement. This particularly applies to assessment. The SMT is expected to learn from past and alternative practice and build on the validity and quality of assessment and marking.

It is anticipated that the criteria will follow the WorldSkills Occupational Standards.

## 4.10 Skill assessment procedures

Assessment and marking are an intense process that depends upon skilful leadership, management, and scrutiny.

The Test Project is independently designed and developed. The Marking Scheme is designed and developed by the SMT in collaboration with the Experts.

Assessment is based on process and outcome, using Measurement and Judgement.

There is daily marking to the extent that does not limit Competitors' reasonable choice of timing and sequence.

## 5 The Test Project

### 5.1 General notes

Sections 3 and 4 govern the development of the Test Project. These notes are supplementary.

Whether it is a single entity, or a series of stand-alone or connected modules, the Test Project will enable the assessment of the applied knowledge, skills, and behaviours set out in each section of the WSOS.

The purpose of the Test Project is to provide full, balanced, and authentic opportunities for assessment and marking across the Standards, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme, and Standards will be a key indicator of quality, as will be its relationship with actual work performance.

The Test Project will not cover areas outside the Standards, or affect the balance of marks within the Standards other than in the circumstances indicated by Section 2. This Technical Description will note any issues that affect the Test Project's capacity to support the full range of assessment relative to the Standards. Section 2.1 refers.

The Test Project will enable knowledge and understanding to be assessed solely through their applications within practical work. The Test Project will not assess knowledge of WorldSkills rules and regulations.

Most Test Projects (and Marking Schemes) are now designed and developed independently of the Experts. They are designed and developed either by the Skill Competition Manager, or an Independent Test Project Developer, normally from C-12 months. They are subject to independent review, verification, and validation. (Section 4.1 refers.)

The information provided below will be subject to what is known at the time of completing this Technical Description, and the requirement for confidentiality.

Please refer to the current version of the Competition Rules for further details.

### 5.2 Format/structure of the Test Project

The Test Project is a single Test Project assessed in stages.

The theme for the design brief will relate to the values and concerns of the Host Country and WorldSkills International.

### 5.3 Test Project design requirements

The Test Project is developed within the agreed assessment criteria framework.

### 5.4 Test Project development

The Test Project MUST be submitted using the templates provided by WorldSkills International ([www.worldskills.org/expertcentre](http://www.worldskills.org/expertcentre)). Use the Word template for text documents and DWG template for drawings.

#### 5.4.1 Who develops the Test Project or modules

The Test Project/modules are developed by an Independent Test Project Designer in collaboration with the Skill Competition Manager.

### 5.4.2 When is the Test Project developed

The Test Project/modules are developed according to the following timeline:

Prior to the Competition	The Test Project/modules are developed.
Three (3) months prior to the competition	The Independent Test Project Designer submits the completed Test Project and SMT submits the completed Marking Scheme to the WorldSkills International Skills Competitions Administration Manager. Advice on the scope and limits of software is circulated to Competitors and Experts on the WorldSkills Discussion Forum.
At the competition on C1	The Test Project is presented to Experts and Competitors.

## 5.5 Test Project initial review and verification

The purpose of a Test Project is to create a challenge for Competitors which authentically represents working life for an outstanding practitioner in an identified occupation. By doing this, the Test Project will apply the Marking Scheme and fully represent the WSOS. In this way it is unique in its context, purpose, activities, and expectations,

To support Test Project design and development, a rigorous quality assurance and design process is in place (Competition Rules sections 10.6-10.7 refer.) Once approved by WorldSkills, the Independent Test Project Designer is expected to identify one or more independent, expert, and trusted individuals initially to review the Designer's ideas and plans, and subsequently to verify the Test Project, prior to validation.

A Skill Advisor will ensure and coordinate this arrangement, to guarantee the timeliness and thoroughness of both initial review, and verification, based on the risk analysis that underpins Section 10.7 of the Competition Rules.

## 5.6 Test Project validation

The Skill Competition Manager coordinates the validation and will ensure that the Test Project/modules can be completed within the material, equipment, knowledge, and time constraints of Competitors.

## 5.7 Test Project selection

The Test Project/modules are selected by the Independent Test Project Designer in collaboration with the Skill Competition Manager.

## 5.8 Test Project circulation

If applicable, the Test Project is circulated via the website as follows:

The Test Project/modules are not circulated prior to the Competition. The Test Project/modules are presented to Experts and Competitors on C1.

However, advice on the scope and limits of software is circulated three (3) months prior to the competition.

## 5.9 Test Project coordination (preparation for Competition)

Coordination of the Test Project/modules is undertaken by the Skill Competition Manager.

## 5.10 Test Project change

There is no 30% change required to be made to the Test Project/modules at the Competition. Exceptions are amendments to technical errors in the Test Project documents and to infrastructure limitations.

## 5.11 Material or manufacturer specifications

Specific material and/or manufacturer specifications required to allow the Competitor to complete the Test Project will be supplied by the Competition Organizer and are available from [www.worldskills.org/infrastructure](http://www.worldskills.org/infrastructure) located in the Expert Centre. However, note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These such items may include those for fault finding modules or modules not circulated.

## 6 Skill management and communication

### 6.1 Discussion Forum

Prior to the Competition, all discussion, communication, collaboration, and decision making regarding the skill competition must take place on the skill specific Discussion Forum (<http://forums.worldskills.org>). Skill related decisions and communication are only valid if they take place on the forum. The Chief Expert (or an Expert nominated by the Chief Expert) will be the moderator for this Forum. Refer to Competition Rules for the timeline of communication and competition development requirements.

### 6.2 Competitor information

All information for registered Competitors is available from the Competitor Centre ([www.worldskills.org/competitorcentre](http://www.worldskills.org/competitorcentre)).

This information includes:

- Competition Rules
- Technical Descriptions
- Mark Summary Form (where applicable)
- Test Projects (where applicable)
- Infrastructure List
- WorldSkills Health, Safety, and Environment Policy and Regulations
- Other Competition-related information

### 6.3 Test Projects [and Marking Schemes]

Circulated Test Projects will be available from [www.worldskills.org/testprojects](http://www.worldskills.org/testprojects) and the Competitor Centre ([www.worldskills.org/competitorcentre](http://www.worldskills.org/competitorcentre)).

### 6.4 Day-to-day management

The day-to-day management of the skill during the Competition is defined in the Skill Management Plan that is created by the Skill Management Team led by the Skill Competition Manager. The Skill Management Team comprises the Skill Competition Manager, Chief Expert, and Deputy Chief Expert. The Skill Management Plan is progressively developed in the six months prior to the Competition and finalized at the Competition by agreement of the Experts. The Skill Management Plan can be viewed in the Expert Centre ([www.worldskills.org/expertcentre](http://www.worldskills.org/expertcentre)).

## 6.5 General best practice procedures

General best practice procedures clearly delineate the difference between what is a best practice procedure and skill-specific rules (section 9). General best practice procedures are those where Experts and Competitors CANNOT be held accountable as a breach to the Competition Rules or skill-specific rules which would have a penalty applied as part of the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System. In some cases, general best practice procedures for Competitors may be reflected in the Marking Scheme.

Equipment failure	<ul style="list-style-type: none"> <li>In the occurrence of equipment failure Competitors must notify Experts immediately by raising their hand. Experts will take note of the time that the Competitor is not able to make use of their equipment. Any time lost due to equipment failure is to be recorded on the "Competitor Time Out" form. Additional time is provided to the Competitor at the end of the standard Module time. No additional time is granted for work not saved prior to the equipment failure.</li> </ul>
Release and translation of Test Project	<ul style="list-style-type: none"> <li>The entire Test Project documentation is released on C1 during the briefing time. This briefing is 30 minutes in length which is followed by Compatriot Communication for 15 minutes. An additional 10 minutes of briefing and Q&amp;A time is scheduled each morning of C2, C3, and C4.</li> <li>Interpreters may use a dictionary or translation device with no Wi-Fi capacity when translating Test Project documents.</li> </ul>
Attending to a Competitor	<ul style="list-style-type: none"> <li>Experts must not attend a Competitor at their workstation without another Expert. The Compatriot Expert may attend at this time to observe or translate if there is no Interpreter. Interpreters can only interpret when they are asked to do so.</li> </ul>
Other	<ul style="list-style-type: none"> <li>The Workshop Manager (or Workshop Manager Assistant) is the only person allowed to load any software/devices onto the Competitor's competition computer.</li> </ul>

## 7 Skill-specific safety requirements

Refer to WorldSkills Health, Safety, and Environment Policy and Regulations for Host country or region regulations.

General PPE for safe areas	√

## 8 Materials and equipment

### 8.1 Infrastructure List

The Infrastructure List details all equipment, materials, and facilities provided by the Competition Organizer.

The Infrastructure List is available at [www.worldskills.org/infrastructure](http://www.worldskills.org/infrastructure).

The Infrastructure List specifies the items and quantities requested by the Skill Management Team for the next Competition. The Competition Organizer will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items. Note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These such items may include those for fault finding modules or modules not circulated.

At each Competition, the Skill Management Team must review and update the Infrastructure List in preparation for the next Competition. The Skill Competition Manager must advise the Director of Skills Competitions of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

### 8.2 Competitors toolbox

Competitors are not allowed to send a toolbox to the Competition. All tools are provided by the Competition Organizer.

### 8.3 Materials, equipment, and tools supplied by Competitors

It is not applicable for the 3D Digital Game Art skill competition for Competitors to bring materials, equipment, and tools to the Competition. However, Competitors are allowed to bring personal tools on the morning of C-2 (Familiarization Day) as defined below. It is recommended that these tools be brought in the luggage of the Competitor or purchased locally.

- Pantone swatches or similar swatch books;
- Sketching paper and pens;
- Calibration charts;
- Keyboard in own language.

Furthermore, Competitors are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements.

### 8.4 Materials, equipment, and tools supplied by Experts

Experts are not required to bring materials, equipment, or tools. All is supplied by the Competition Organizer.

Experts are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements.



## 9 Skill-specific rules

Skill-specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from skill competition to skill competition. This includes but is not limited to personal IT equipment, data storage devices, Internet access, procedures and workflow, and documentation management and distribution. Breaches of these rules will be solved according to the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System.

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Use of technology –  
USB, memory sticks

- Skill Competition Managers, Chief Expert, Deputy Chief Expert, Competitors, Experts, and Interpreters must not bring any form of digital storage (ram/hard drive) into the workshop.

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Use of technology –  
personal laptops, tablets  
and mobile phones

- Skill Competition Managers, Chief Expert, Deputy Chief Expert, Experts, and Interpreters are allowed to use personal laptops, tablets, and mobile phones during competition hours. Personal tablets and laptops brought to the competition must remain locked in the workshop until the conclusion of competition on C4. Mobile phones can be taken out of the workshop at lunchtime and at the end of each day.
- Competitors are not allowed to use personal laptops, tablets, or mobile phones in the workshop. Personal tablets and laptops brought to the competition must remain locked in the workshop until the conclusion of competition on C4. Mobile phones must remain locked in the workshop until the end of each competition day.

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Use of technology –  
personal photo and  
video taking devices

- Chief Expert, Deputy Chief Expert, Experts, Competitors, and Interpreters are allowed to use personal photo and video taking devices in the workshop at the conclusion of the competition only on C4.

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Use of technology –  
other devices

- Skill Competition Manager, Chief Expert, Deputy Chief Expert, Experts, Competitors, and Interpreters must not bring a keyboard or mouse with internal memory.
  - Competitors may use an MP3 player, but the device must not have Wi-Fi/Internet access capabilities. The devices are checked and accepted by the workshop manager on C-1. If a device will not meet the requirements it is kept by the Workshop Manager until the conclusion of competition on C4.
  - Experts and Interpreters are not to use MP3 devices at any stage from C-4 until C+1.
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Tools/infrastructure

- Competitors are not allowed to access the Internet while in the workshop.
- Skill Competition Manager, Chief Expert, Deputy Chief Expert, Experts, Competitors, and Interpreters are allowed to access the Internet while in the workshop.
- Competitors are not allowed to use the following:
  - Books with design references
  - Images/clip art

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Drawings, recording information

- Chief Expert, Deputy Chief Expert, Experts, Competitors, and Interpreters are not permitted to bring notes into the workshop under any circumstances.
  - All notes made at the Competitor workstation must remain on the Competitor's desk at all times. No notes may be taken outside of the workshop until the competition has concluded on C4.
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## 10 Visitor and media engagement

Following is a list of possible ways to maximize visitor and media engagement:

- Try-a-Skill;
- Display screens showing a combination of Competitor profile and screen capture of current work;
- Test Project descriptions;
- Enhanced understanding of Competitor activity;
- Career opportunities;
- People's Choice Award

# 11 Sustainability

This skill competition will focus on the sustainable practices below:

- Recycling - No printing for Competitor workstations;
- Use of “green” materials;
- Use of completed Test Projects after Competition;
- Limit the amount of software to be installed on Competitor workstations;
- Open source software

## 12 References for industry consultation

WorldSkills is committed to ensuring that the WorldSkills Standards Specifications fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Occupational Standards on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (<http://www.ilo.org/public/english/bureau/stat/isco/isco08/>) ILO 2166
- ESCO: (<https://ec.europa.eu/esco/portal/home>)
- O\*NET OnLine ([www.onetonline.org/](http://www.onetonline.org/))

This WSOS (Section 2) is closest to *Multimedia Artists and Animators*:  
<https://www.onetonline.org/link/summary/27-1014.00>,

and also to *Digital Artist*:

<http://data.europa.eu/esco/occupation/d5c4ab26-c293-4f4d-ad89-fe776f49a67f>.

These links can be also be used to review adjacent occupations.

There were no responses to the requests for feedback this cycle.