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Autodesk Tinkercad 3D Design Exam Objectives

Tinkercad

AUTODESK Tinkercad

Target Audience

The Autodesk Tinkercad 3D Design exam is designed for an individual who has foundational 3D design skills. They have approximately 20 hours of direct instruction, and an additional 20-30 hours of hands-on experience with the application. They have shown interest in 3D modeling, 3D fabrication, and transitioning into more advanced tools such as Autodesk Fusion or Revit.

Candidate Description

A successful candidate can navigate Tinkercad's 3D workspace and tools. They can create, modify, and combine shapes to build functional 3D models, while considering design intent and real-world constraints. The candidate understands basic transformations, grouping, and duplication as well as utilize measurement tools to create functional models. They can think critically about the design process, make strategic decisions, and collaborate by sharing and/or remixing projects.

Prerequisites

It is expected that all candidates will have a general understanding of:

- Computer skills: copy/paste, undo, etc.
- Understand basic geometry (shapes, edges, faces, points, planes, etc.)
- Create a new 3D Design and give it an identifiable name
- Understand Creative Commons/copyright within the technical space

Objective Domain

Some of the topics and features of the software that may be covered in the exam are listed below each objective.

Note: Within the context of this exam series, all references to "create, select, manage, etc." indicate "know how to create, select, manage, etc."

1. Workspace and Navigation

1.1 Navigate the environment

1.1.a Change your viewpoint

i. Use the View Cube, Pan, Zoom, Orbit, Fit to View, and Home

1.1.b Apply views

i. Orthographic views

ii. Perspective views

1.2 Manipulate object appearance

1.2.a Hide and show objects

1.2.b Set transparency

i. Identify the benefit of making an object transparent

1.2.c Set color

1.2.d Enable Multicolor

i. EX. Which of the following scenarios would allow you to apply multicolor?

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1.3 Integrate measurement tools

1.3.a Choose the appropriate units for your design

i. Specify the project units

ii. Set the workspace size

1.3.b Specify precision values

i. Set the Snap Grid

ii. Use radial snap

1.3.c Use the Ruler

i. Identify relative and absolute measurements

2. Create

2.1 Select and place the appropriate shapes

2.1.a Add primitive shapes

2.1.b Use the Shapes Library

i. Search for a shape

ii. Understand the content of each shape library

iii.Understand shapes that are accurately scaled to represent real world items

2.1.c Create and reuse custom shapes

i. Add your own creations

ii. Understand the benefit of reusing custom shapes

2.1.d Identify which location to place a shape

i. Default workplane

ii. Temporary workplane

iii.Cruise

2.1.e Add and edit a scribble

2.2 Modify the properties of a shape

2.2.a Understand the difference between a solid and a hole

2.2.b Understand what you can or cannot do with a shape when it's locked

2.3 Add and edit a sketch

2.3.a Draw lines

2.3.b Draw a Bézier curve

i. Line, smooth, or break

2.3.c Add or remove points

3. Transformations

Modifying shapes along or around an axis.

3.1 Apply a translation

3.1.a Align a shape relative to another shape

3.1.b Move a shape relative to a workplane (raise, lower, drop)

3.1.c Drag a shape along a workplane

3.2 Reorient a shape

3.2.a Rotate a shape around an axis

3.2.b Mirror a shape around an axis

3.3 Change the size of a shape

3.3.a Uniform scaling vs non-uniform scaling

3.3.b Use handles

i. Understand black vs white handles

ii. Understand the impacts of using handles and the shape parameter values

3.3.c Modify the size of the shape using text input

3.3.d Make real world scaling/dimensional decisions

i. Tolerance

ii. Size relativity

4. Compound Operations

Using skills that a user would have to work in any computer program with the transformations available in Tinkercad.

4.1 Group shapes

4.1.a Combine and subtract shapes

4.1.b Ungroup

i. Understand how the order of creating groups affects the design (nesting)

4.2 Duplicate shapes

4.2.a Duplicate and Repeat

i. Patterning

ii. Radial

4.2.b Copy, cut, and paste shapes

i. Within a single design

ii. Across designs

5. Design Process

5.1 Demonstrate an understanding of the design process

5.1.a Understand how to make strategic design decisions

i. Understand different design cycles; iterative, linear, circular, cyclical, trial and error, etc.

ii. Optimize a design for fabrication and functionality

iii. Reduce waste and support materials

iv. Dependencies and constraints

v. Print tolerance and sequential grouping

5.2 Identify situations for collaboration and sharing designs

5.2.a Bring an external design into your project

i. Understand what designs can be imported into a design and why

ii. Import an external file

5.2.b Use notes to share design intent

5.2.c Export a project for the desired fabrication

i. Specify the appropriate file types

5.2.d Send the design

i. Fusion

ii. 3D Communities and Services

iii. Publish to gallery

iv. Understand Creative Common licensing

5.2.e Invite a person to design with you

5.2.f Remix from an existing project