Kids Can CAD Academy

Intro to 3D Design & 3D Printing

Level: Elementary

KIDS CAN CAD

IMAGINE - DESIGN - CREATE

www.KidsCanCAD.com

Intro to 3D Design & 3D Printing

LESSON 1……

Begin a discussion with students by asking them the following questions:

1. **Who knows what Engineers, Architects, or Designers do?**
   Explain in simple terms that there are many different types of engineers, architects, and designers. Engineers design things like roads, bridges, cars, airplanes, and architects design things like buildings. All designers have one thing in common; they must create plans, blueprints, drawings, models, or some kind of instructions to help explain their ideas so that they can be built.

2. **Who knows what CAD means?**
   Explain in simple terms that CAD stands for 'Computer Aided Design' and that it simply means to use computers to help us draw, or design. In this course we will use computers and a computer program to help us create our designs.

3. **Who has played Minecraft before?**
   What we will be doing in this class is similar to playing Minecraft. We'll be building objects on the computer using building blocks with different shapes.

4. **Who knows what a 3D Printer is?**
   Once we have designed an object using the computer, we can print it in 3 dimensions with a 3d printer, and we will be able to hold it and take it home.

5. **Start Tinkercad**

   - Go to Tinkercad.com
   - Click **Join Now** to create an account
   - Sign in
   - Create **New Design**

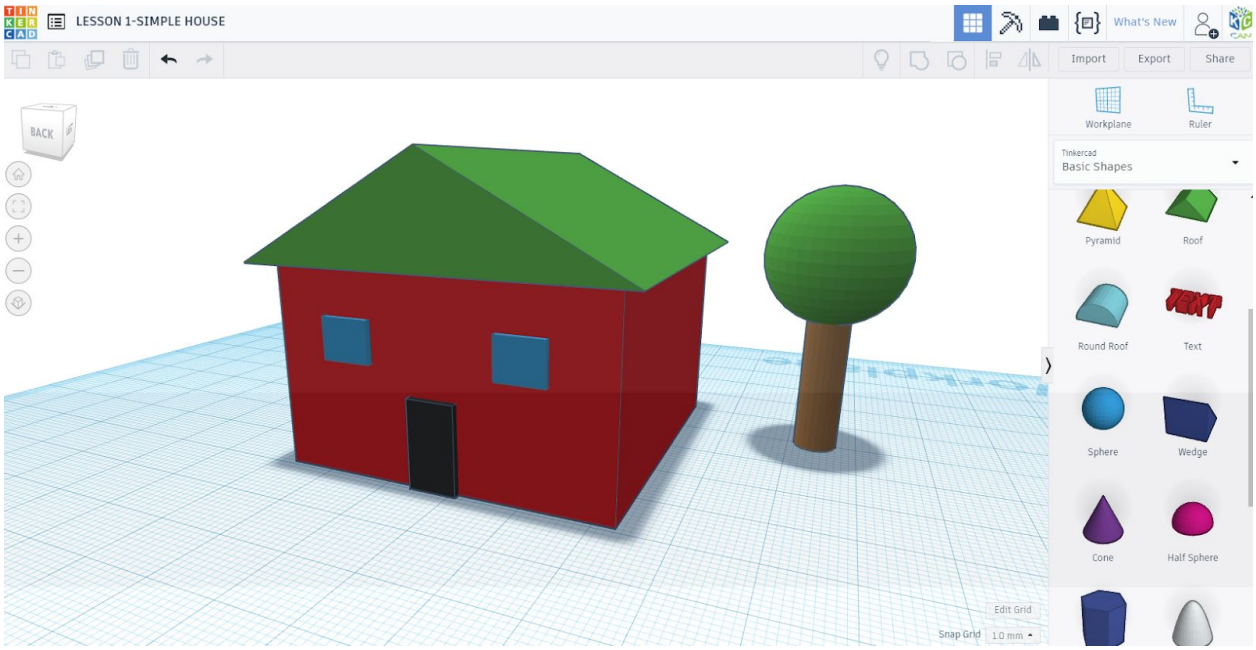
6. **New Commands**

   Explain/Demonstrate the following commands:

   - Drag and Drop shapes
   - Orgit
   - Zoom In/Out
   - Pan
   - Move (x, y, and z)
   - Stretch
   - Rotate
   - Scale
   - Select Multiple
   - Delete
   - Undo
   - Redo

7. **Exercise 1 - SIMPLE HOUSE (Architecture)**

   Demonstrate how to create this simple house and tree using the commands from this lesson:



8. **Lab Time**

   Allow students time to complete the exercise.

LESSON 2.....

1. **Review the following commands/terms:**

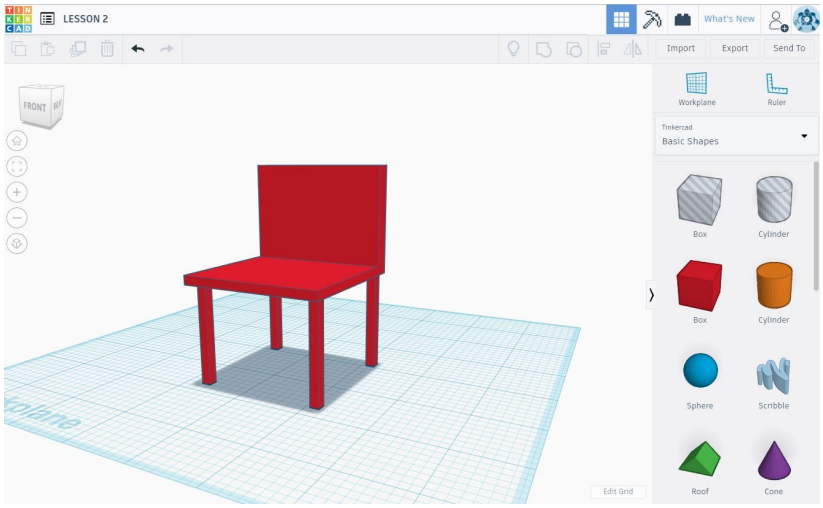
- Drag and Drop shapes
- Orgit
- Zoom In/Out
- Pan
- Move (x, y, and z)
- Stretch
- Rotate
- Scale
- Select Multiple
- Delete
- Undo
- Red

2. **Introduce the following New Commands:**

- Shape Properties
- Copy/Paste
- Duplicate
- Group/Ungroup

3. **Exercise 2 - CHAIR (Interior Design)**

Demonstrate how to create this simple chair using the commands from this lesson:



4. **Lab Time**

Allow students time to complete the exercise.

LESSON 3……

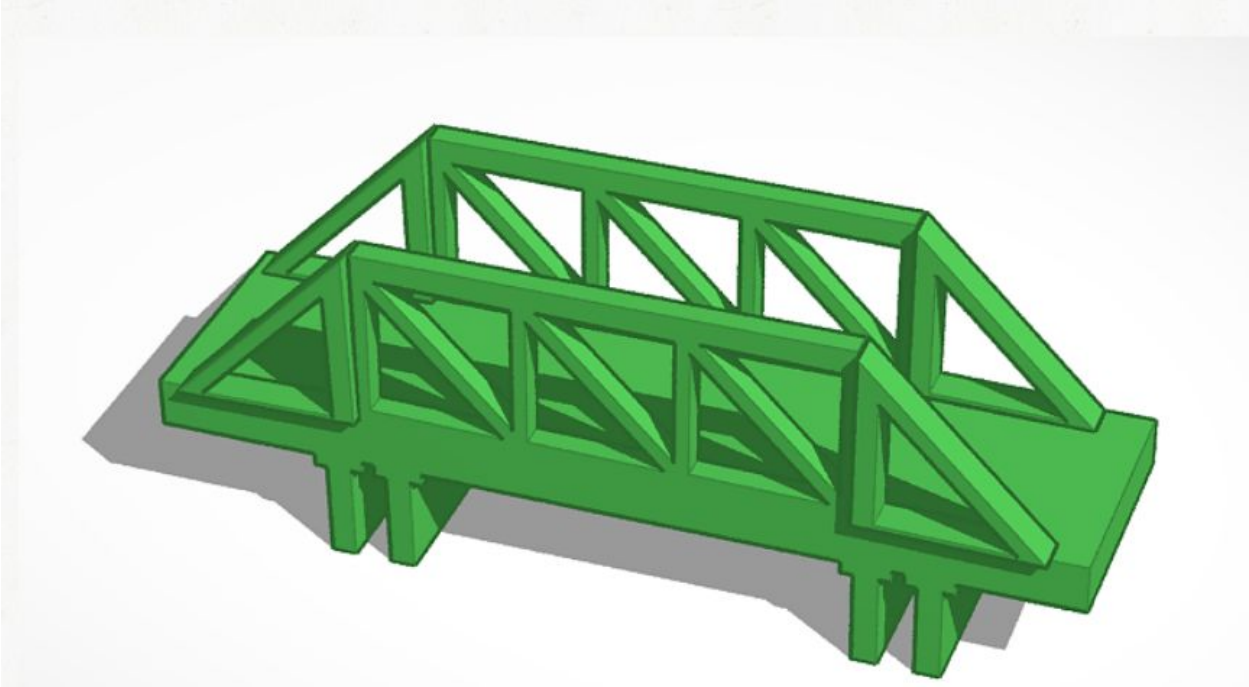
1. **Review the following commands:**

    - Shape Properties
    - Copy/Paste
    - Duplicate
    - Group/Ungroup

2. **Introduce the following New Commands:**

    - Holes
    - Transparency

3. **Example Lesson 3 - BRIDGE (Engineering)**



4. **Lab Time**

    Allow students time to complete the exercise.

LESSON 4……

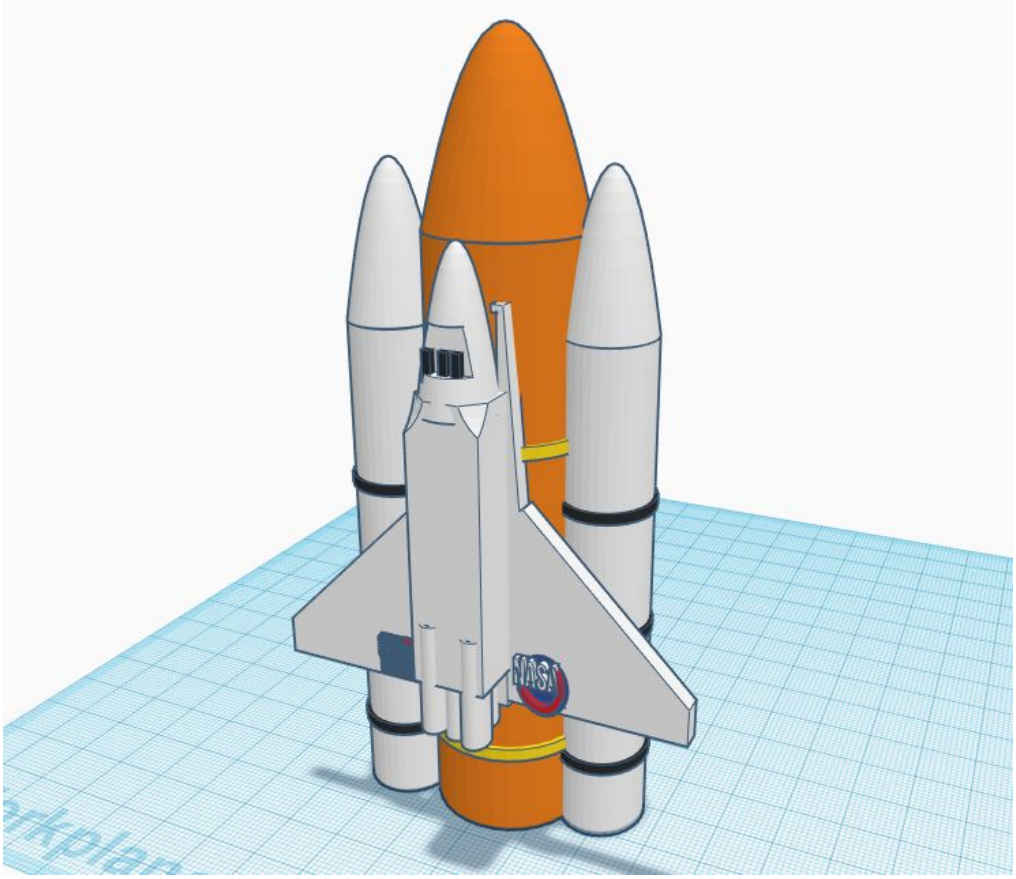
1. **Review the following commands:**

    - Holes
    - Transparency

2. **Introduce the following New Commands:**

    - Align
    - Mirror

3. **Example Lesson 4 - ROCKET (Engineering)**



4. **Lab Time**

    Allow students time to complete the exercise.

LESSON 5……

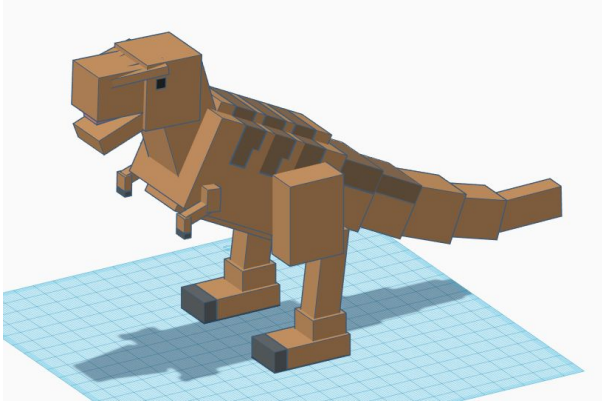
1. **Review the following commands:**

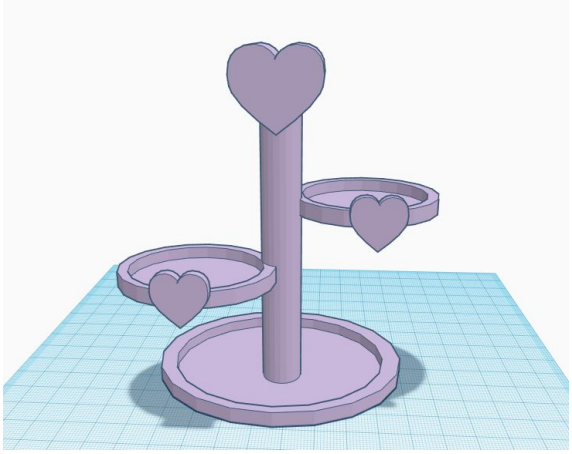
    - Align
    - Mirror

2. **Introduce the following New Commands:**

    - Workplane

3. **Example Lesson 5 - (JEWELRY/ANIMATION)**





3. **Lab Time**

    Allow students time to complete the exercise.

DAY 6……

1. **Review the following commands:**

    - Workplane

2. **Introduce the following New Commands/topics:**

    - Export
    - 3d Printing

- Use the Export command to download a model.
- This will create a .stl file that can be found in the Downloads folder.
- Open the downloaded file using the program associated with the 3d printer to be used.
- Follow the instructions provided in the 3d printer's user guide to print the model.
- When the model begins to print, explain to the students how the filament is loaded into the extruder and when the right temperature is reached in the extruder, the filament is melted and laid in layer by layer to create the model.

3. **Give students their 3d printed project.**