

VIRTUAL DESIGN AND CONSTRUCTION VOLUNTEER GUIDE

At the Virtual Design and Construction station, students are introduced to a digital 3D model of a building that shows how all parts of the structure fit and work together before construction begins. This technology helps builders and trade professionals plan ahead, coordinate their work, and reduce mistakes. During this session, students will explore a model of a middle school and see how the building will look and function once it is built.

Before the session begins, **please review:**


- **Virtual Design and Construction Volunteer Guide**
- **Virtual Design and Construction PowerPoint**
- **Device Preparation**
- **Program Use During Session**

Device Preparation

Laptop Login:


- **Email:** bim03@jastl.org
- **Password:** JAcadbim33

Before students arrive:

- **Click Source on remote and then click on DVI.**
- **Open Virtual Design and Construction Introduction PowerPoint.**
 - Click the Virtual Design and Construction icon to open the introduction slide deck.
 - Click on slideshow icon in lower right corner.
- **Start the Virtual Design and Construction Project.**
 - Click the  to open the program.
 - Double-click the **Junior Achievement Training** project to open the project.
 - Ensure **3D Mode** is selected at the top of the screen.
 - A 3D model of **NEW OPS MIDDLE SCHOOL** should appear on all devices.
 - If gridlines appear, click the **Toggle Grids** icon (bottom bar) to hide them.
 - Students will sit (5) per side at the station



Program Use During Session

- The **[home]** button  acts as a reset button in between tasks.
- As students navigate from task to task, remind them to click the **[home]** button between all activities.
- Students should *not* navigate from room to room.
- Students should work in a room then click on **[3D]** at the top of the page then click **[home]** to bring up the entire school on the screen.
 - Click on the next room that they would like to work in.
- If you or the students are experiencing issues that cannot be resolved, X out of the program without powering down, then restart the program.
- Clear the cache on each computer at the end of the visit day and, if possible, in between each student group
 - Go to **[Project]** in the upper left corner.
 - Click **[Open]**.
 - Right click on **[JA Trades]**.
 - Click **[Clear Cache]**.
 - Click **[Select data to clear]**.
 - Check **[All]**.
 - Clear all data.
- At the end of the visit day after clearing the cache, download for field.
 - Go to **[Project]** in the upper left.
 - Click **[Open]**.
 - Right click on **[JA Trades]**.
 - Click **[Download for field]**.
 - Close out (**X out**) at the end of the day but do not power down.

Read Aloud (Bolded Sections)

Welcome to Virtual Design and Construction! Today, you will get hands-on experience exploring how buildings are planned and built using Virtual Design and Construction, based on the design of a middle school.

Direct students' attention to the PowerPoint.

(Slide 2) **Have you ever heard of blueprints? Blueprints are drawings builders use to plan a building. Today, the construction industry often uses something more advanced called Virtual Design and Construction. It uses 3D digital models and technology to plan a building before construction starts, helping teams work together and avoid problems.**

(Slide 3) **Virtual Design and Construction helps teams coordinate systems like heating and air conditioning, plumbing, lighting, fire protection, and structure. Skilled tradespeople including plumbers, electricians, HVAC workers, fire protection teams, and steelworkers use these tools to make sure everything fits and works together. This approach improves safety, reduces mistakes, saves time and money, and supports energy-efficient buildings. It can be used on computers, tablets, and smartphones, and careers using these skills are in high demand.**

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(Slide 4-5) **Does anyone recognize this building? The St. Louis Aquarium is a great example of Virtual Design and Construction in action. Digital tools were used to plan complex systems like the piping and life-support systems that keep more than 13,000 sea animals healthy. These tools also helped designers plan how visitors move through the space and experience the exhibits.**

(Slide 6) **If you enjoy working on computers, design, or technology, Virtual Design and Construction might be a great fit for you. It is especially good for visual learners and people who enjoy problem-solving and teamwork. It also opens the door to many fast-growing careers in construction and design.**

(Slide 7) **There are several ways to get started in this field. Community colleges, such as STLCC, offer related courses, and many construction companies provide on-the-job training. There are also online and university certificate programs available. Because these skills are in demand, professionals in Virtual Design and Construction roles can earn average salaries between about \$86,000 and \$105,000 per year.**

Activity 1: Navigation and Trade Identification

Navigation Basics:


- Use mouse to look around.
- Use W-A-S-D keys to move or use your mouse
 - W – Forward
 - A – Left
 - S – Backward
 - D – Right

Exploration Task:

Navigate around the screen and find the following objects outside the building:

- Dump truck
- Crane truck
- Cement truck

Using Viewpoints

Click on the Viewpoints icon  in the upper left of your laptop. These are saved views within the model.


- **Click the arrow next to Home Base.**
- **Click the arrow next to the Junior Achievement folder.**
- **Click on Gymnasium.**
- **What do you see?** (They should see a basketball player, scoreboard, bleachers, etc.)
- **BIM is all about the collaboration of different trades job roles in the construction industry in a virtual environment leading to more efficient project delivery.**

Assigning Trade Jobs

Give each student one trade card:

- **Plumber:** condensate pipes, roof drains, water lines
- **Electrician:** electrical conduit, lighting systems, fixtures
- **Fire Protection:** sprinklers, alarms, suppression systems
- **Steelwork:** structure, framing, carpentry
- **HVAC Technician:** air ducts, sheet metal, welding

Find Your Trade Objects

- Click **3D** at the top of the screen.
- Click the **Rooms** icon.  It looks like a door.
- Type **Instrumental 203** in the search bar.
- Find the objects that match your given trade.
- Color Coding: Point out the colors associated with each trade (top left of the screen).

Trade	Color
Electrician	Yellow
Fire Protection Contractor	Bright Red
Plumber	Gold
HVAC Technician	Blue and Green
Steelwork Contractor	Dark Red

Does anyone want to share what they found?

Activity 2: Collaboration and Issue Tracking

The next activity is about collaboration between job roles. What is collaboration? You will enter a room and find a conflict, or problem. You will then decide what job roles are involved and what two trades workers will fix the issue first and decide why.

- Click "Issue Tracker".
- Give students the following Issue ID numbers one at a time.
- Give the students time to determine the problem and what two trades workers will fix the problem.
- Ask for volunteers to provide the answers.
 - **12:** Electrician and HVAC Contractor
 - **72:** Plumber and Steelwork Contractor
 - **11:** Plumber and HVAC Contractor
 - **10:** Fire Protection Contractor and HVAC Contractor