

### Lesson #5: Scale Drawing Project (3-day Project)

#### Objectives

Students will be able to...

- Apply ratios and proportions to make a scale drawing of their classroom.

#### Common Core Standards

Problem Solving and Critical Thinking 5.1  
Responsibility & Flexibility 7.5  
CTE Pathway D1.1, 1.3, & 4.1  
Leadership & Teamwork 9.3  
RSIT 11-12.2  
RLST 11-12.2

#### Materials

Scale Drawing Project Guidelines  
Measuring Tapes  
Graph paper  
Rulers  
Calculators  
Group Planning Self-Assessment

#### Lesson Sequence

- Day 1: Review ratio and scale. (5 minutes)
- Go over *Scale Drawing Project Guidelines* and answer any questions about the project.
- Divide students up into teams of 2-3 students.
- Day 1 and 2 students work together on project.
- Day 3: Have group members exchange room drawings with one another and check the labeled dimensions of the drawings by using the designated scale.
- Each student will fill out *Group Planning Self-Assessment*.

**Assessment**

Daily monitor student participation and understanding of scale drawings. Check for understanding through questioning and informal observations.  
Use student self-assessment for grading group work.  
Grade students on effective scale drawings through the activity of student are checking each other's scale drawings.

**Accommodations/Modifications**

Check for Understanding  
One-on-One Support  
Strategic Pairing  
Extra Time If Needed

## Scale Drawing Project Guidelines

You will apply ratios and proportions to help you make a scale drawing of our classroom.

### **Materials needed:**

Measuring tape, millimeter graph paper (graph paper provided is millimeter squares), ruler, calculator, and pencil.

You are trying to convince your teacher to rearrange their classroom. With your partner, make a scale drawing (blueprint) to show how your classroom will look after you have reorganized it. Use proportions to draw a scale drawing of your classroom and **at least 8 items** in your classroom. (five items will be given, and you can choose the other **three**).

**Five mandatory items are: teacher's desk, 3 student desks, cabinet, work area and the student cubbies or area to hang up backpacks.**

For this project you will need to:

1. Sketch a map of the classroom's shape and the location of its walls, windows, and doorways.
2. Measure the size of the classroom (length and width). Include the width of windows and doorways, and the distance to walls from each side of the windows and doorways. (Round to the nearest half-inch).
3. Measure the eight items currently in your classroom (length and width to the nearest half inch).
4. Convert these measurements to scale measurements using a scale factor of .5cm = 10 in.

### **2 BLOCKS=CM**

5. Create a table listing the following:

- Object
- Dimension of the object

Example: desk measures 18 in by 24 in

- Proportion used to determine the scaled size of each object in your blueprint.

Example: desk measures 18 in wide – scale .5 cm = 10 in *Each Block is .5cm*

$$\frac{.5cm}{10in} = \frac{x}{18in} \quad \text{Remember} \quad \frac{\text{Drawing}}{\text{Actual}}$$

- ALL work used to solve proportion. (Keep your work neat and organized.)
  - Round your measurements to the nearest half cm.
  - Size of Objects on Blueprint – List the size you will draw each object on your blueprint
6. Using graph paper, pencil and a ruler, make a blueprint of your classroom to scale. Make sure to use a ruler and label the measurements on your blueprint.

# BUILDING INDUSTRY TECHNOLOGY ACADEMY: YEAR ONE CURRICULUM

**Table - Proportions to Make Blueprint** (Use separate sheet of paper for your work).

Objects	Dimensions	Proportion used to determine scaled size of objects	Work to solve Proportion	Size of Objects in Blueprint
1. Student Desk	Length – 24 inches  Width – 18 inches	$\frac{x}{24in} = \frac{.5cm}{10in}$	Show all steps!	
2. Room	Length –  Width -			
3. Teacher Desk	Length -  Width -			
4. Cabinet				
5. Student Cubbies				
6.				
7.				
8.				

**Group Planning: Self-Assessment - Rubric**

CATEGORY	4	3	2	1
<b>Working with Others</b>	Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together.	Usually listens to, shares, with, and supports the efforts of others. Does not cause "waves" in the group.	Often listens to, shares with, and supports the efforts of others, but sometimes is not a good team member.	Rarely listens to, shares with, and supports the efforts of others. Often is not a good team player.
<b>Preparedness</b>	Brings needed materials to class and is always ready to work.	Almost always brings needed materials to class and is ready to work.	Almost always brings needed materials but sometimes needs to settle down and get to work	Often forgets needed materials or is rarely ready to get to work.
<b>Focus on the task</b>	Consistently stays focused on the task and what needs to be done. Very self-directed.	Focuses on the task and what needs to be done most of the time. Other group members can count on this person.	Focuses on the task and what needs to be done some of the time. Other group members must sometimes nag, prod, and remind to keep this person on-task.	Rarely focuses on the task and what needs to be done. Let's others do the work.
<b>Time-management</b>	Routinely uses time well throughout the project to ensure things get done on time. Group does not have to adjust deadlines or work responsibilities because of this person's procrastination.	Usually uses time well throughout the project but may have procrastinated on one thing. Group does not have to adjust deadlines or work responsibilities because of this person's procrastination.	Tends to procrastinate, but always gets things done by the deadlines. Group does not have to adjust deadlines or work responsibilities because of this person's procrastination.	Rarely gets things done by the deadlines AND group must adjust deadlines or work responsibilities because of this person's inadequate time management.

# BUILDING INDUSTRY TECHNOLOGY ACADEMY: YEAR ONE CURRICULUM

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CATEGORY	4	3	2	1
<b>Group Timeline</b>	Group independently develops a reasonable, complete timeline describing when different parts of the work will be done. All students in group can independently describe the high points of the timeline.	Group independently develops a timeline describing when most parts of the work will be done. All student's in-group can independently describe the high points of the timeline.	Group independently develops a timeline describing when most parts of the work will be done. Most students can independently describe the high points of the timeline.	Group needs adult help to develop a timeline AND/OR several students in the group cannot independently describe the high points of the timeline.
<b>Delegation of Responsibility</b>	Each student in the group can clearly explain what information the group needs, what information s/he is responsible for locating, and when the information is needed.	Each student in the group can clearly explain what information s/he is responsible for locating.	Each student in the group can, with minimal prompting from peers, clearly explain what information s/he is responsible for locating.	One or more students in the group cannot clearly explain what information they are responsible for locating.
<b>Plan for Organizing Information</b>	Students have developed a clear plan for organizing the information as it is gathered and in the final product. All students can independently explain the planned organization of the work.	Students have developed a clear plan for organizing the information in the final product. All students can independently explain this plan.	Students have developed a clear plan for organizing the information as it is gathered. All students can independently explain most of this plan.	Students have no clear plan for organizing the information AND/OR students in the group cannot explain their organizational plan.

**Total Points** \_\_\_\_\_