Drawing ART
Our first lesson in making an A

In today’s worksheet, we’re going to figure out how to make an ‘A’ in class. But first we’ll figure out how to make a ‘T’!

Consider Figure 1, which shows the beginning of a 1-point perspective drawing of a 3-dimensional ‘T’. That is, the front face of the 3-d ‘T’ is parallel to the picture plane; lines going into the distance have a vanishing point on the horizon. Your job will be to figure out construction techniques (maybe one, maybe several) for correctly finishing that picture.

Figure 1: Draw the bottom bar of this T.

To see how tricky this is, compare the drawings in Figures 2 and 3. Both are obviously wrong, even though the back line is vertical and the bottom line goes to a vanishing point.

Figure 2: This base is probably too long compared to the top.
Figure 3: This base is probably too short compared to the top.

There are many different correct construction techniques, but few of them are immediately obvious. So feel free to take your time, doodle even. Use your straightedge, your pencil, and definitely your eraser! You may draw directly on Figure 1.

When you and the class have conquered the letter ‘T’, you should use your new-found mastery to complete the unfinished ART.
Homework

Art Assignment

A3. Write a word that is at least 4 letters long in 1-point perspective. The letters should be a constant width, the spaces between them should be a (smaller) constant width, and the depth of the letters should be constant (see Figure 4). The width of the lines in the letters should appear to be constant (the bar in a “T” is the same width as bars in an “H”, for example). Give the word a surrounding context (is it sitting on a table? mounted on the back wall of a room? In a vast plane with buildings on the horizon?)

Draw lots of lines; draw neatly; erase no-longer-needed construction lines carefully and completely. You may be tempted to embellish your figure with decorations. You should do so—in fact, the more perspectively-correct embellishments there are, the better the picture will look. But you must use a straightedge for every line you draw, and you should not draw any curves.

Figure 4: This ‘T’ is not in one-point perspective. You’ll get to things like this in future assignments.
Instructors’ notes for “Drawing ART”

Materials needed:

- pencil
- eraser
- straightedge
- [Instructor only] yard sticks, chalk/whiteboard makers, board erasers

Lessons of the worksheet:

- problem solving

- artistic application of the rules “Lines parallel to the picture plane have parallel images; lines not parallel to the picture plane but parallel to one another converge to the same vanishing point”.

The problem of finishing the ‘T’ is deceptively easy to state; many students will nonetheless find it challenging to solve. I usually give students 5 minutes before I start giving the frustrated ones a few hints; altogether I usually give the class 10–15 minutes to work on the problem and confer with one another. (During those initial 5 minutes, I use a yardstick as a straightedge and put about four copies of started ‘T’s on the board.)

As the students work, I like to peek at their solutions. There are many ways to solve this problem, and when I do divulge a hint, I try to give a technique that other students haven’t hit upon—see Figures 5–7 for the three most common approaches.

When people have made progress, I first answer the question that many students will have: can you just measure? (No; observe that the left and right edges on the top of the ‘T’ are different lengths). Then I have students put as many solutions on the board as possible, and I have different students explain the construction technique of each problem. This gets the students really thinking about geometry.

Occasionally I’ve found it useful to put an interesting-but-incorrect solution on the board. It’s good to acknowledge creative attempts, and even to encourage the class to think together about whether there is a way to “fix” that solution. We’ve often found that these “mistakes” become useful somewhere later in the class.

Once the solutions are on the board, it is useful to have the questions, Which solution is your favorite? What are the advantages of each solution? What are the disadvantages? Some solutions can be easily generalized. Some solutions have few lines. Some solutions draw most of their construction lines away from the actual drawing, making erasing easier. Some solutions (like the transparent one in Figure 6) are complicated but they look really cool when they’re done well. It’s good to get students realizing that different solutions can be equally correct but vary in elegance or ease of use.

Finally, I begin the solution from Figure 8 and ask students to finish it. It’s a nice reminder that diagonal lines can be parallel to the picture plane.
When the ‘T’ discussion is over, you should ask students to complete the word ‘ART’.

Figure 5: Drawing a T by adding scaffolding to the outside.

Figure 6: Drawing a T by pretending the letter is transparent.
Figure 7: My favorite solution.

Figure 8: The beginning of a solution shown me by a precocious 7-year-old in Washington State. Can you see what the next step is?