Design a High School for Your Grandchildren

A project developed by Eeva L. Reeder for her geometry students at Mountlake Terrace High School, WA
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The Problem:

Working as a member of an architectural team in 2050, you are competing against other companies to win the contract to design a state-of-the-art high school for the given site (see CAD drawing). You must present your proposed design to a panel of professional architects, who will be awarding the contract. Your design must meet the learning needs of students in the year 2050, must accommodate 2000 students, and must make use of the natural benefits of this particular site, while also preserving at least half of the existing wetland.

Required Products & Performances:

(1) scale model
(2) site plan
(3) floor plan(s)
(4) perspective drawing
(5) cost estimate
(6) written proposal
(7) design file
(8) presentation to architects

See detailed description of each product, attached.

Timeline:

June 11	**Products due** to Ms. Reeder by noon.
June 12-13	**Presentations to the architects.** Order of presentation determined by volunteers or by lottery.
June 14	**Fieldtrip** to architects' downtown office to receive their feedback and learn who won the contract. This is followed by a guided walking tour of Seattle's architectural highlights, from the oldest buildings in Pioneer Square to the newest building at the Seattle Center (Experience Music Project). Lunch at the Center with a couple hours inside EMP.
June 15	**Debrief**, reflect, evaluate teamwork skills.

Team Selection & Operation:

- Teams may have **no more than four members**. Three is ideal.
- Each team must have **a Project Manager** (PM) chosen from the list of names provided. If more than one person from the PM list is on the same team, only one can be PM.
- Each team must justify to Ms. Reeder that it comprises **all the necessary "gifts"** to deliver high-quality products and performances.
- Each team must define **a Team Operating Agreement** , signed by each team member. In the event a member must be fired (in accordance with your Team Operating Agreement), he/she must work the remaining time on an independent project and must forfeit the fieldtrip.

Tips: Past experience shows it to be wise not to work on the same team with someone you are dating or wish you were dating, nor to work with very close friends ("it's too hard to get on their case when they slack off").

Project Assessment:

- Ms. Reeder will assess the first six products above: *200 points*
- Professional architects from Wise-Miller will assess the presentation and marketing; the architecture and educational plan; the overall site use; and the degree of accountability, including environmental impact and cost estimate: *200 points*
- You assess yourselves and your teammates on teamwork skills: *100 points*

Rubrics for each of the above are attached

Description of Required Products:

1. Scale Model

The scale model represents a typical learning space (classroom). If you have several different types of learning spaces, choose whichever one you think will leave the best impression on your audience.

- **CONSTRUCTION OPTIONS:**
  - cardboard, tag board, foam core, colored paper, plastic, glue guns, and other supplies are provided

- **REQUIRED ELEMENTS:**
  - include major furniture items like tables & storage units—chairs are not necessary
  - cut out openings for windows & doors
  - include a "paper doll" person inside to help viewers understand the scale

2. Site Plan

A site plan demonstrates how the site will be developed—it shows what you'd see if you flew over the site (e.g., a "footprint" of all buildings, and any parking lots, athletic fields, roads, etc.). You may level hills, but you must approximate the size of the area flattened, and add this expense to the total cost calculations (see item #5).

- **CONSTRUCTION OPTIONS:**
  - use CAD (Chris is available to help, and will show you how to access the CAD file on the server—CAD machines are available during tutorial & after school)
  - ***or*** cut out building shapes and paste them on the CAD drawing of the site
  - ***or*** carefully draw the buildings by hand on the CAD drawing of the site

- **REQUIRED ELEMENTS:**
  - everything must be to correct scale (use given scale on CAD drawing)
  - clearly label each building and developed area—a key may be helpful
  - at least half the wetland area must be preserved, or you're in violation of local law and unlikely to be hired
  - the plan must be visible from the back of the room

3. Floor Plan(s)

The floor plans show the outline of each building (*buildings* only, not athletic fields or parking lots). They also show the location of interior walls, windows and exits.

- **IT IS NOT NECESSARY:**
  - to arrange the buildings the way they appear on the site plan
  - to draw identical floors more than once for a multiple-story building
  - to show furniture

- **CONSTRUCTION OPTIONS:**
  - use Visio (on computers in LRC & room 133)
  - use a computer drawing program (e.g., Adobe Illustrator)
  - carefully draw the floor plans by hand on the oversize graph paper

- **REQUIRED ELEMENTS:**
  - indicate the scale being used
  - all buildings/interior spaces must be clearly labeled
  - use a standard symbol for windows and doors

4. Perspective Drawing

The perspective drawing is a 3-D "artist's rendering" of what the campus looks like. It's your chance to capture the viewer's imagination and convey the spirit of the place (e.g., quiet, bustling, back-to-nature, high-tech, ...).

- **IT IS NOT NECESSARY:**
  - to show the whole campus
  - to draw to an exact scale
  - to draw in two-point perspective

- **CONSTRUCTION OPTIONS:**
  - paper and colored pens and pencils are provided

- **REQUIRED ELEMENTS:**
  - show detail such as building texture, landscaping, background

5. Cost Estimate

The cost estimate is the total projected cost for developing the site, including construction of buildings, bulldozing of hills, and creation of athletic fields.

- **PRESENTATION OPTIONS**:
  - use a spreadsheet
  - create a table such as the sample attached
  - create your own display

- **REQUIRED ELEMENTS**:
  - all totals must be *easily* verifiable (e.g., show dimensions, units, and formulas used, and label all subtotals)
  - the cost for constructing buildings is $350 per square foot
  - the cost for leveling hills is $100 per square foot
  - the cost for constructing athletic fields is $150 per square foot
  - append the cost estimate to the written proposal

- **HEADS UP**:
  - all dimensions used must match those shown on the floor plans!!!
  - calculation errors could cost you the contract!!!

6. Written Proposal

The written proposal is your chance to: (1) explain all the advantages of your plan in detail, (2) sell your idea as the best one out there and persuade the architects to hire you. Your aim is to convince the prospective client that you've considered every possible need of theirs and will not only meet all their needs, but meet them brilliantly, or even exceed them. Refer to posted examples of professional proposals for ideas on layout, tone, content, and use of graphics.

- **REQUIRED ELEMENTS:**
  - explain your vision for teaching and learning in 2050
  - defend your building design decisions—explain how form follows function
  - use a respectful, business-like tone—you're proposing to spend a great deal of taxpayers' money
  - include a cover page with company logo and names of members, include section headings and a table of contents
  - document must be word processed
  - append the cost estimate

7. Design File

The design file is a record of your problem-solving and creative process (an accordion folder is provided for storage), and a place to keep rejected ideas for potential revisiting. It contains hard evidence that you employed a systematic method to finding the best possible solution to the building design, site use, cost, and marketing problems.

- **REQUIRED ELEMENTS**:
  - building and site sketches, with brief notes on rejected ideas
  - notes from team meetings
  - rough drafts of written proposal and oral presentation

8. Oral Presentation to Architects

The objective of the oral presentation is to highlight the strengths of your proposal and convince your client that you can handle the job. Your potential client (the panel of architects) gets a sense for what it would be like to work with you by the competence and sincerity you express, and by how you answer their questions and respond to their needs.

The oral presentation is the architects' first impression of you, and often a lasting one. Experience shows that first impressions tend to die hard—a strong presentation can overcome weaknesses in the proposed design, and a weak presentation can create a deficit that is difficult to overcome even with a strong proposal.

- **PRESENTATION OPTIONS**:
  - you decide how many team members will make the presentation, but whomever stands up there *must* have a speaking role (no Vannas)
  - feel free to use PowerPoint (available in library) or any other appropriate audio/visual aids

- **REQUIRED ELEMENTS**:
  - each team member, whether presenting or not, must be introduced to the architects
  - you are limited to 10 minutes to explain your proposal, which will be followed by 5 minutes of questions from the architects
  - you must prominently display the site plan, floor plan(s), perspective drawing, and scale model
  - whomever presents must be able to answer any question asked by the architects—team members who remain seated are not allowed to chime in from their seats in the audience

A Suggested Place to Start:

Past experience has shown it to be very helpful if you do the following two steps first as a whole team before you divide the project tasks.

1. Design an ideal learning space

A learning space is where most of the learning activities will happen. Your plan may end up including several different types of learning spaces.

CONSIDER:

- what is the most inspiring, inviting & interesting learning space you can imagine?
- what would school have to be like to make you <u>want</u> to spend a lot of time there?
- how many students would you put into one learning space at a time?
- how important is it to you to have natural light in a room?
- what's the most engaging technology you can imagine might exist in 2050? How would this technology change the way you learn math, French, history, science, etc.?
- what if high school graduation was not based on accumulating 4 years' worth of credits, but on your ability to prove you had certain skills? What kinds of things would be important for students to know and be able to do in a technology-driven world?
- how much space would be needed to accommodate the technology and the types of learning activities you envision?

2. Decide how the site would best be used

FIRST DECIDE:

- in what ways could the undeveloped site be used as a powerful place to learn? how much of this is worth preserving?
- how much of the site are you willing to give up for parking?...athletic fields? ...roads? (are there other options worth considering?)
- how could you develop the site so that the whole community could enjoy & use it?
- what compass direction gets the most sunlight during the day—how does this affect the way you orient a courtyard, for example?

THEN FIGURE OUT:

- how many learning spaces you'll need to accommodate 2000 students
- whether to stack the learning spaces, fan them, scatter them, cluster them, etc.—consider how to arrange things so buildings can be quickly evacuated in an emergency
- how to connect all the spaces (walkways on the ground, above ground, underground?)—consider how to ensure good "circulation" (how to avoid foot-traffic congestion)
- what other spaces are required (e.g., eating spaces, hanging-out spaces, administrative spaces, performance spaces, work-out spaces, etc.), and where it makes sense to put them
- how transportation on and off the site will happen—where vehicles (if any) will be parked, and how emergency vehicles will gain access