

The Baseball Project

[Introduction](#) 1

Faculty: [Hugh Dubberly](#)

[The Baseball Project](#) 2

School: *The examples shown are from the Institute of Design, IIT, in Chicago. Dubberly has also taught the exercises at Art Center College of Design in*

[Making Meaning](#) 3

[Representing Interaction](#) 4

Students: *College-level seniors and first year masters-level graduates. Students have had introductory and intermediate 2-D design and typography courses, as well as familiarity with design systems and processes—though the course offers ample opportunity to elaborate on those subjects. No specific computer skills are prerequisites.*

[Read responses](#)

[Respond to this article](#)

 Hugh Dubberly describes this series of work as a step-by-step approach to introducing information architecture. More than a sequence of related assignments, this is a significant plan for an entire course where students come to understand a body of content in preparation for designing interactive systems. The work reflects on a whole range of information design problems; yet it is focused on the structure, or architecture, of information rather than the methods of diagramming. It also touches on aspects of interaction design, or user experience design, but that is not its primary focus.

Dubberly emphasizes that students can successfully complete all these assignments using conventional tools such as pencil and paper. Skills in computer technology applications can be helpful in the class—not for improving the quality of design per se, but for increasing the number of options considered, and for speeding the process of creating a high level of finish.

Having his students focus on the understanding of a body of content, Dubberly postpones consideration of delivery by computer (and of interaction) until the final steps of realization. He identifies three components of understanding and uses these as distinct sections for the coursework:

- 1) Gathering data,
- 2) Structuring and representing the data in multiple ways
- 3) Synthesizing the data, structures and representations.

Through this process students come to own the content and create for themselves a set of content assets: texts, photos, illustrations and diagrams. They learn to look at the content from different points of view and begin to understand how methods of structuring and representing information affect content and influence perception.

Dubberly has chosen the game of baseball and how to play it as the content. Specifically, he asks students to “describe how to play baseball to an adult speaker of English (someone over 12) who is unfamiliar with the game.” Dubberly cites a number of reasons why he believes this subject is appropriate.

Baseball is a system: it consists of elements and their relationships. Because its boundaries can be defined (or agreed upon), it is discrete. Since the entire system cannot be held in the mind at once, it is complex. However, it is also finite, even relatively small. As a game, it is a fun subject, not a serious, technical one. Students have different levels of expertise with the subject of baseball, with easy access to qualified reviewers and to information about it.

While he acknowledges some concern for those who might see the subject as having inappropriate gender, cultural or other biases, Dubberly believes the range of relationships students have with the game is a strength. “In the classes I have taught, I find students who have never played or even seen the game

alongside avid fans and players,” he says. “I have students from the United States as well as other countries. The students with knowledge of the game help those unfamiliar with it. Students new to the game also bring an important asset: a beginner’s mind. These students are more easily able to put themselves in the shoes of the intended audience. In fact, they begin as the intended audience. They sometimes have an advantage in seeing what’s important, whereas an avid fan may get lost in details.”

Among the examples shown are sequences of diagrammatic interpretation studies in the final form of a poster. Inspirational to this project and its content is work from students in Krystof Lenk’s classes at Rhode Island School of Design (RISD). (1) Dubberly is indebted to Lenk for the original idea that he borrowed to form the basis for this series of assignments.

Course outline:

1) Gathering data

In order to understand the subject, students are asked to participate in an actual game, read the official rules and other explanations, and summarize a specific game.

By going outside and playing a short, informal game, everyone is exposed to the basic elements and to first-hand experience of the flow or process of play. Alternatively, students might be asked to watch a game. The drawback to watching is that some students may not understand what they’re seeing, or they may not pay attention, or they may simply not watch at all.

Providing a copy of the rules of baseball, or asking the students out to find the rules requires reading. (2) For undergraduates, a test might provide the needed incentive. Students might also be asked to find and read books introducing and explaining the game and review these in class.

Students are finally asked to record and summarize a real baseball game—using more than just video. An easily readable summary is presented, such as a sequence of key frames grabbed from video or shot with a camera or a text transcript, or a completed score card. The score card provides a way to introduce the general idea of scoring—a notation for recording all sorts of things. Scoring is also an important branch of the information design. (3)

2) Structure and represent the data in multiple ways

This focuses on analyzing the data and internalizing it—on really understanding it. Students do that by organizing the data into different structures and re-presenting it. Work generated in this section includes the organization of related verbal terms, a narrative essay and diagrammatic interpretations that form the basis of final presentations.

The class, as a group, lists terms related to baseball in a 10-to-15 minute session yielding 50-to-75 items. The instructor, acting as a facilitator for this brainstorming session, writes down all the terms suggested by the students (none are “wrong”). The instructor also involves all the students making sure no one dominates, reminds the group of the focus on how to play the game and asks questions to elicit more terms should the group get stuck.

The class edits the list, deleting terms not relevant to explaining how to play the game—for example, names of players or specific teams. Remaining terms are discussed as to how they might be related and grouped (conscious that there are several possible groupings and that a term may be in more than one group). Finally, remaining terms are discussed as to how they might be ranked: Which are key concepts? Which are least important? Which are merely details?

Each student is then assigned the task of writing an essay describing how to play the game of baseball. This exercise is divided into a series of steps:

- **List terms to include**
- **Define each term**
- **Rank the terms**
- **Write an outline**

- **Write a first draft**
- **Edit the draft to create a final draft**
- **Format the text using the tools of typography to make it clearer**

Students begin with the terms from the previous exercise and determine which ones need to be included in the essay. They are asked to write definitions of all the terms before organizing them, and to decide on a ranking for each term: major, minor or detail. The ranking leads to a draft outline. This is reviewed for completeness and structure, and a final version is produced.

While the essay may belong logically in the third section on synthesizing the data, structures and representations, it is important to be placed in this section because students already have some writing skills and can focus on the content rather than on new techniques. The essay also establishes a foundation for further work by making sure all students demonstrate a basic understanding of the subject. The outline of the essay may also serve as a basis for the concept map to follow (even though the converse is also true: the concept map and the process flow diagrams might well serve as bases for the essay).

Reviewing and copy editing outlines and drafts of essays can be a substantial amount of work for the instructor, particularly when the writing skills of the students are poor. An alternative to having individuals develop an outline is to have small groups develop it together and to include peer reviews of both the outlines and the essays.

Create a concept map

A concept map is a picture of our understanding of something. It is a diagram illustrating how sets of concepts are related. Concept maps are made up of webs of terms (nodes) related by verbs (links) to other terms (nodes). The purpose of a concept map is to represent (on a single visual plane) a person's mental model of a concept. (4)

Concept maps provide a useful contrast with essays. With a concept map, a viewer can see both the forest and individual trees. The big picture is clear because all the ideas are presented on one surface. At the same time, it's easy to see details and how they relate.

Examples and a good description such as those described by Gowan and Novak's (5) are essential for students to learn concept mapping. Students may benefit from an exercise in which they quickly (perhaps in class) make a simple concept map (with eight to 12 terms).

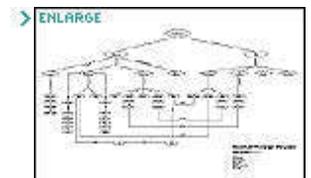
Students begin the baseball concept map by going back to the list of terms and their definitions. A useful exercise is to create a matrix listing all the terms down one side and repeating the list across the top. The relationship between the terms is noted in the boxes where a row and column intersect. The resulting matrix of relationships provides a checklist for building the concept map.

Students review the ranking of the terms, the outline of the essay and then consider the main branches from the primary term (baseball). One approach is to ground the primary term within a sentence that also contains the other two or three most important terms. A first sentence might set context; a second sentence might define the main term branching out at 90 degrees from the first sentence.

A second phase is giving the map an appropriate typographic form — to make the typographic hierarchy support the structure of the content.

The exercise is divided into a series of steps:

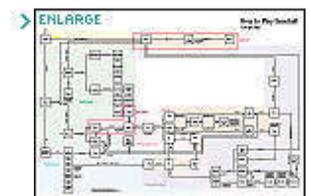
- **List terms**
- **Edit the list**
- **Define the remaining terms**
- **Create a matrix showing the relations of terms**
- **Rank the terms**
- **Decide on main branches or write framing sentences**



Concept Map. Suzan Boztepe, Chujit Jeamsinkul, Soo-Jin Jeong, Linda Pulik, Napawan Sawasdichai, Elisa Vargas.



Concept Map. Eric Swanson, Mark Faga, Andy Schultz, Hsin-Hsuing Liu, Tairan Sun, Somatat NaTakuatung.



Concept Map. Praima Chayutsahakij, Yu Guo, Brian Herzfeldt, Mike LaManna.

- **Fill in the rest of the structure**
- **Use color and the tools of typography to clarify and make the content more accessible**
- **Create a final version (22 x 34 inches, full color; 11 x 17 inches is generally not large enough for a readable map of 50 terms)**

The concept map assignment works well for individuals as well as a team project for groups of two to five. Groups are able to create richer maps in a given time than individuals. The experience of developing shared understanding through the process of co-creating a concept map is valuable in and of itself. It may also make an interesting and useful team-building exercise.

Undergraduate students working on the project in teams will probably benefit from a discussion of team dynamics before they begin. Teams discuss roles, disclose their availability and map the process they plan to follow.

Create a process flow diagram

Concept maps are good for defining a set of terms and for defining rules. Essentially they are descriptive. But understanding involves both description and prescription. Rules gain meaning when applied to an activity. One way to represent activities is with process flow diagrams.

More advanced students may come across the problem of describing the process of playing baseball in their concept maps. Sometimes they will present concept maps with partial process flows imbedded. Such mixed diagrams are great points of departure for the process flow assignment and should be discussed with the entire class.

Students are asked to create a diagram mapping the process of playing baseball. When the diagram is complete, it should be possible to trace the sequence of steps in any play in any game on the diagram. Most of the game lends itself easily to a decision tree. The simultaneous action of fielding and base running is more difficult to map.

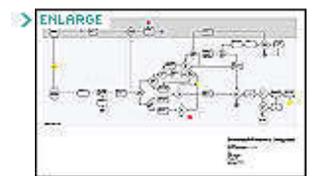
Students unfamiliar with process flow diagrams can be shown examples explaining the basic building blocks of events and decision points—a question (often represented as a diamond) to which the answer must be yes or no—and feedback loops. As an introduction, students might be asked to make a process flow diagram describing the operation of a simple system such as a thermostat and heater.

In creating their diagrams, students are asked to consider the divisions of time within the game; nested and repeated sequences; counting, or how the system/diagram tracks the state of the game; and decision points.

The exercise is divided into a series of steps:

- **List operators (players) and their roles**
- **Define things to be counted**
- **Define boundary conditions (beginning and ending)**
- **Begin with a walkthrough, sketching each step**
- **Fill in the rest of the structure**
- **Reorganize to create a coherent overall structure**
- **Use color and the tools of typography to clarify and make the content more accessible**
- **Create a final version (22 x 34 inches, full color; 11 x 17 inches is generally not large enough)**

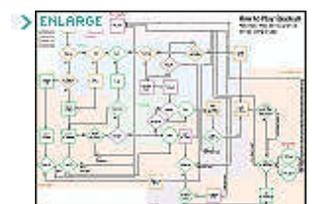
Students with experience in programming are challenged to apply it. Tracking state involves creating variables; repeated sequences and nesting is similar to creating and calling functions. Students with no programming experience can complete the assignment, though it may be less mature or less



Initial and final process flow diagrams. Boztepe, Jeamsinkul, Jeong, Pulik, Sawasdichai, Vargas.



Process flow diagram. Swanson, Faga, Schultz, Liu, Sun, NaTakuatung.



Process flow diagram. Chayutsahakij, Guo, Herzfeldt, LaManna.

The concept map and process flow diagram are tools to help the design team think about the subject; but they may prove poorly suited to explaining how to play the game to a naïve audience.

analytical. Undergraduates may find this difficult. Like the concept maps, process flow diagrams lend themselves to development by team.

3) Synthesizing the data, structures and representations

Having worked with the information in a number of forms, students are prepared to produce more finished work that is directed toward end users. The concept map and process flow diagram are tools to help the design team think about the subject, but they may prove poorly suited to explaining how to play the game to a naïve audience (though they're quite useful for discussions with experienced audiences). The assignments related to synthesis (as with the essay) focus on communicating with the original audience of adults unfamiliar with the game.

Create a poster (diagrammatic form)

Students are asked to focus on explaining how to play baseball using primarily visual means (diagrams, illustrations and photographs). Students organize the information on a single surface to create a "poster" with a minimum of text. The concept maps and process flow diagrams are points of departure for the poster, used as check lists for concepts to include and as direct sources of content.

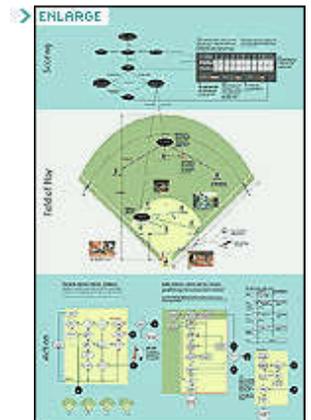
This assignment emphasizes the importance of a strong organizing principle for the content; the need for a strong visual hierarchy; and the need to set expectations for a high level of finish in the final result.

The exercise is divided into a series of steps:

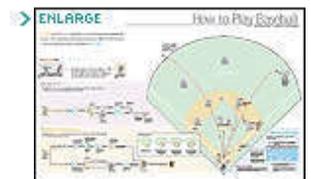
- Sketch at least five alternative main concepts or organizing principles, 8 1/2 x 11 inches
- Sketch at least five alternative organizational structures for the selected concept
- Create a full-size pencil rough showing all information for the selected structure
- Create a tight comp showing all information, probably in Illustrator format
- Create a final poster (22 x 34 inches, full color; 11 x 17 printers can be used for comps)



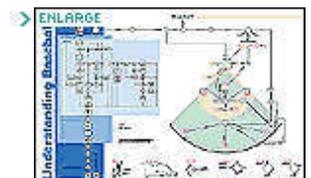
Poster. Boztepe, Jeamsinkul, Jeong, Pulik, Sawasdichai, Vargas.



Poster. Swanson, Faga, Schultz, Liu, Sun, NaTakuatung.



Poster. Chayutsahakij, Guo, Herzfeldt, LaManna.



Poster. Lisa Bloss, Matt Diamanti, Colm Nelson, Jane Schaefer, Brian Stonecipher.



Poster. Joanna Barth, Kord Brashear, Maria Silvia Serra, Jeffrey Tull, Denis Weil.

Students are able to focus on what an interactive system can provide that might not be available in other media—rather than on understanding the subject and creating content.

The main focus of this assignment is diagramming, which the students undertake themselves. Allowing appropriation of photos and illustrations for use in details or examples (with appropriate attribution) saves time and focuses students on the structure of the information. Requiring students to create their own illustration and photography may mean more time allotted to the project.

Extending the coursework.

The logical extension of this project is the development of a narrative booklet and, finally, an interactive system (both not shown). As before, the problem is to explain how to play baseball using a combination of visual and verbal means. For the publication design, students build on the assets of the essay and poster to produce a sequence of double-page spreads bound in a booklet. They also consider the organizing principle for the booklet—an idea that ties the spreads together in addition to visual hierarchy and quality of finish.

An interesting variation on this assignment is to require the students to layer in a description of a real game—individual plays, a summary or the whole game. Weaving the story of a particular game together with a description of how to play provides an extra challenge and may yield a richer result.

An interactive version of the content offers a culmination of students' work in gathering, structuring and synthesizing the data. Students now understand the content, have seen it organized in several structures and have seen those structures represented in many forms. They've also developed a set of content

assets. The earlier assignments form a strong foundation for moving to the interactive world. By taking these early steps first, the last step is much smaller. Students are able to focus on what an interactive system can provide that might not be available in other media—rather than on understanding the subject and creating content.

In this assignment, which is better suited for teams than individuals, students are asked to create an interactive (computer-based) system to explain how to play baseball. They are challenged to consider what an interactive medium allows that was not possible within the constraints of the earlier assignments.

With the interactive project, it's important to introduce students to the idea of usability testing. Of course, user feedback can improve the poster and the booklet as well. Students may be encouraged or required to show their work to users and present a summary of feedback to the class. The process of usability testing is explained with rough paper prototypes—how the operation of a working system can be simulated. Working in teams, one member acts as facilitator, one as note-taker and one responding to the user's decisions by presenting the appropriate parts of the prototype.

An interesting variation on the assignment is to require the students to layer in animation, a simulation or even a game for users to play. Weaving the game and the description of how to play baseball together will yield a richer result.

Students can design the interactive system entirely on paper. This option is especially attractive if access to computers is limited for the classroom or for students. In fact, it's not a bad idea even if computers are available. Students, however, are normally quite eager to work on the computer. Hypercard, Director and HTML are all good development environments and require little learning from students. (6) 

Notes

(1) Krystof Lenk teaches at RISD and is a partner in the design firm Dynamic Diagrams in Providence, Rhode Island. A few examples of his students' work are printed in *Graphis* magazine, number 238, July/August 1985, page 50.

(2) A [version of the rules of baseball](#) is available on the web.

(3) A good, short introduction to [scorecards and their use](#).

(4) See *Learning How to Learn*, by Gowan and Novak, for a more detailed description of concept mapping.

(5) See *Designing Business* by Clement Mok; and AIGA's journal, *Gain*, volume 1, issue 1, for examples of complex concept maps (a model of the Internet, a model of search, model of experience, and a model of brand).

(6) John Maeda's programming language, DBN, described in his book, *Design by the Numbers*, is also a potential development environment—though the learning curve might be somewhat steeper.

 **Hugh Dubberly**, of Dubberly Design Office, was most recently creative director at Netscape. He has also taught in the graphic design department at San Jose State University. He also was director of interface design for Times Mirror, chair of the computer graphics department at Art Center College of Design, and managed corporate identity and creative services at Apple Computer. Dubberly chaired the ACD's 1995 Living Surfaces Conference.