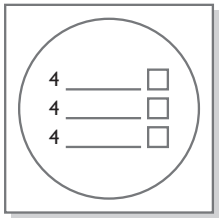
Model

1 Cellular

Are we or how are we setting curricular priorities?

Periscope—one direction; one sighting; narrow focus on single discipline or content area.



The traditional model of separate and distinct disciplines, as depicted by student learning standards in each discipline.

Example

The teacher applies this view in mathematics, science, social studies, humanities, fine and practical arts.

"Education is the instruction of the intellect in the laws of Nature."
—Thomas Huxley

Let's not dismiss the traditional model too lightly. It has worked for many years. There must be a reason it has survived the test of time.

WHAT IS THE CELLULAR MODEL?

The traditional curricular arrangement dictates separate and distinct disciplines. Typically, the four major academic areas are labeled mathematics, science, language arts, and social studies. Fine arts and practical arts pick up other subjects, including art, music, and physical education, while technology, drafting, graphic arts, business, and accounting may be slotted in the technical arts. Another grouping of the disciplines uses the categories of humanities, sciences, practical arts, and fine arts. In the standard curriculum, these subject matter areas are more often than not taught in isolation, with no attempt to connect or integrate them. Each is seen as a pure entity in and of itself. Each

has separate and distinct content standards. Although there may be overlap between physics and chemistry, the relationship between the two is implicitly, not explicitly, approached through the curriculum.

WHAT DOES IT LOOK LIKE?

In middle and high school, each discipline is taught by different teachers, in different locations throughout the building, with the students moving to different rooms. Each separate encounter carries with it a separate and distinct cellular organization, leaving students with a compartmentalized view of the curricula. A less severe cellular model, with subjects still taught separately and apart from each other, is the elementary classroom. In this situation the teacher says, "Now, put away your math books, and take out your science packets. It's time to work on our science unit." The daily schedule shows distinct time slots for mathematics, science, and social studies. Often topics from two areas are not intentionally correlated. This isolation of subjects can be the norm, even in the self-contained classroom, as content standards reign supreme.

WHAT DOES IT SOUND LIKE?

A young high school student once explained the traditional curriculum like a vaccination: "Math is not science; science is not English; English is not history. A subject is something you take once and need never take again. It's like getting a vaccination; I've had my shot of algebra. I'm done with that."

In one day, typical junior high school students may be asked to perform in seven or eight very different subjects, from mathematics to physical education. They will do this every day in addition to the homework that each subject generates. To cope with such a workload, students may have to choose between focusing on the one or two subjects they enjoy doing, and excel in them, and doing the minimum required to get by in the other subjects. Readers may wonder, "What do students learn under these circumstances? Are the needs of the system taking precedence over the needs of the students?"

WHAT ARE THE ADVANTAGES?

One of the advantages of this cellular model, of course, is that the purity of each discipline is left untainted. In addition, instructors prepare as experts in a particular field and have the luxury of digging into their subjects with both breadth and depth. This traditional model also provides a comfort zone for all concerned because it represents the norm. We're used to it. The weight of these pluses must not be taken too lightly. There is value in examining one discipline or subject as a separate and distinct entity in order to reveal the critical attributes of each discrete field. In fact, each discipline is a way of thinking that is

inherent and tailored to its field. For example, mathematicians have distinct ways of categorizing problems, while literature aficionados glory in their various genres. Each and every discipline offers rigor in its way of thinking about the world, and immersion in the various disciplines has immense benefits in rounding out the spectrum of thinking for learners of all ages.

This model, although it appears at first to be somewhat fragmented, does indeed provide clear and discrete views of each discipline. In turn, the model affords a particular way of thinking, through the qualities of designated disciplines, that enhances the perspectives of learning. In addition, experts can easily sift out the priorities of their own subject areas as they live and breathe with their passion for their subject matter. In the final analysis, students are able to realize the true benefits of this cellular model when working with a mentor.

WHAT ARE THE DISADVANTAGES?

The disadvantages are threefold. First, learners are left to their own resources in terms of making connections and integrating similar concepts. Second, overlapping concepts, skills, and attitudes are not illuminated for the learner; thus, transfer of learning to novel situations is less likely to occur. To leave the learner unattended in making connections both within and across disciplines is to overlook some of the latest research on transfer of learning, which calls for explicit shepherding of the transfer with hugging and bridging strategies. Third, in this discipline-based model, students can easily get caught in an avalanche of work. Although each teacher assigns a reasonable amount, the cumulative effect can become overwhelming for students.

WHEN IS THIS CELLULAR MODEL USEFUL?

The cellular model is a useful curricular configuration in a number of cases. It works for large schools with diverse populations because these schools may offer a variety of courses that provide a spectrum of subjects to target special interests. It is also useful, of course, at the university level, where students travel on specialized paths of study that require expert knowledge for instructing, mentoring, coaching, and collaborating. This model is also helpful in teacher education programs, as the preparation can be more focused. And it is a good model for practicing teachers who want to sift out curricular priorities in order to manage the abundance of content standards as they prepare cross-departmental models for interdisciplinary planning.

Figures 1.1–1.3 are examples of completed cellular model integration exercises, and Figure 1.4 provides the opportunity for readers to record their own design for this model.

Model 1: Cellular

Readers' Theater

"On My Own"

Narrator

Meanwhile, back at the school, teachers with periscopic vision are unintentionally burying their students with homework as they individually plan their curricula . . .

Maria Novela, Language Arts

Students can rent the movie *Romeo and Juliet* over the weekend. They will be familiar with the plot, and on Monday we can focus on the beauty of Shakespearean English.

Tom Time, History

This list of topics will help students select their semester projects on Western Civilization. They can start researching their projects this weekend.

Sue Sum, Mathematics

If we get through this lesson today, I'll assign these theorems for weekend homework.

Bob Beaker, Science

Students can read the chapter on the periodic table of elements over the weekend. It's long, but then they'll have a jump on the rest of the semester.

HOW TO INTEGRATE THE CURRICULA WORKING WITH MODEL 1: CELLULAR

Essential Reasoning:

> *"I prioritize the fundamental or basic understandings first; then I look for the topics, concepts, or units that can be given a different weight."*

To work with Model 1, the Cellular Model, think about the elements of the curriculum. First, select one subject (math, science, social studies) that you teach at the elementary level or one class prep (algebra, geometry, trigonometry) that you have at the middle or high school level.

Once you have a focus on the subject or prep, think about the curriculum standards addressed, and list all of the relevant topics of study for that area.

After you have listed the topics of study, think about which ones are most important and which are least important. Then prioritize the list by numbering the items, with 1 as most important and the highest number as least important. This process is known as a forced ranking, but it is helpful to discern the significance of each topic.

After you have made your decisions, dialogue with a partner in the same department or a similar grade level about the curricular priorities in that discipline. Discuss how you set priorities and what considerations you make in deciding how to weigh the various pieces of the targeted curriculum. Let your partner comment on your list.

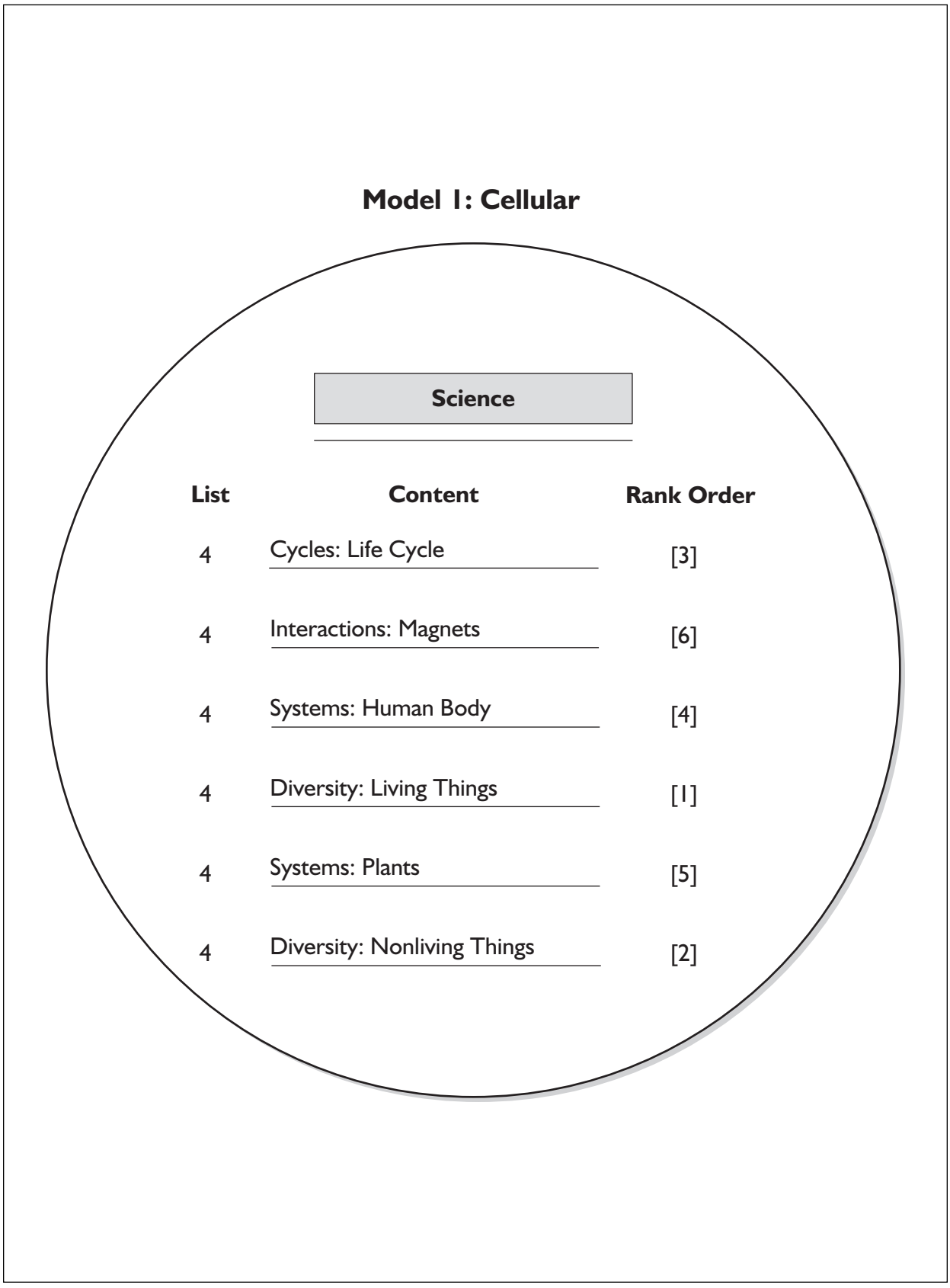


Figure 1.1 Elementary School Example

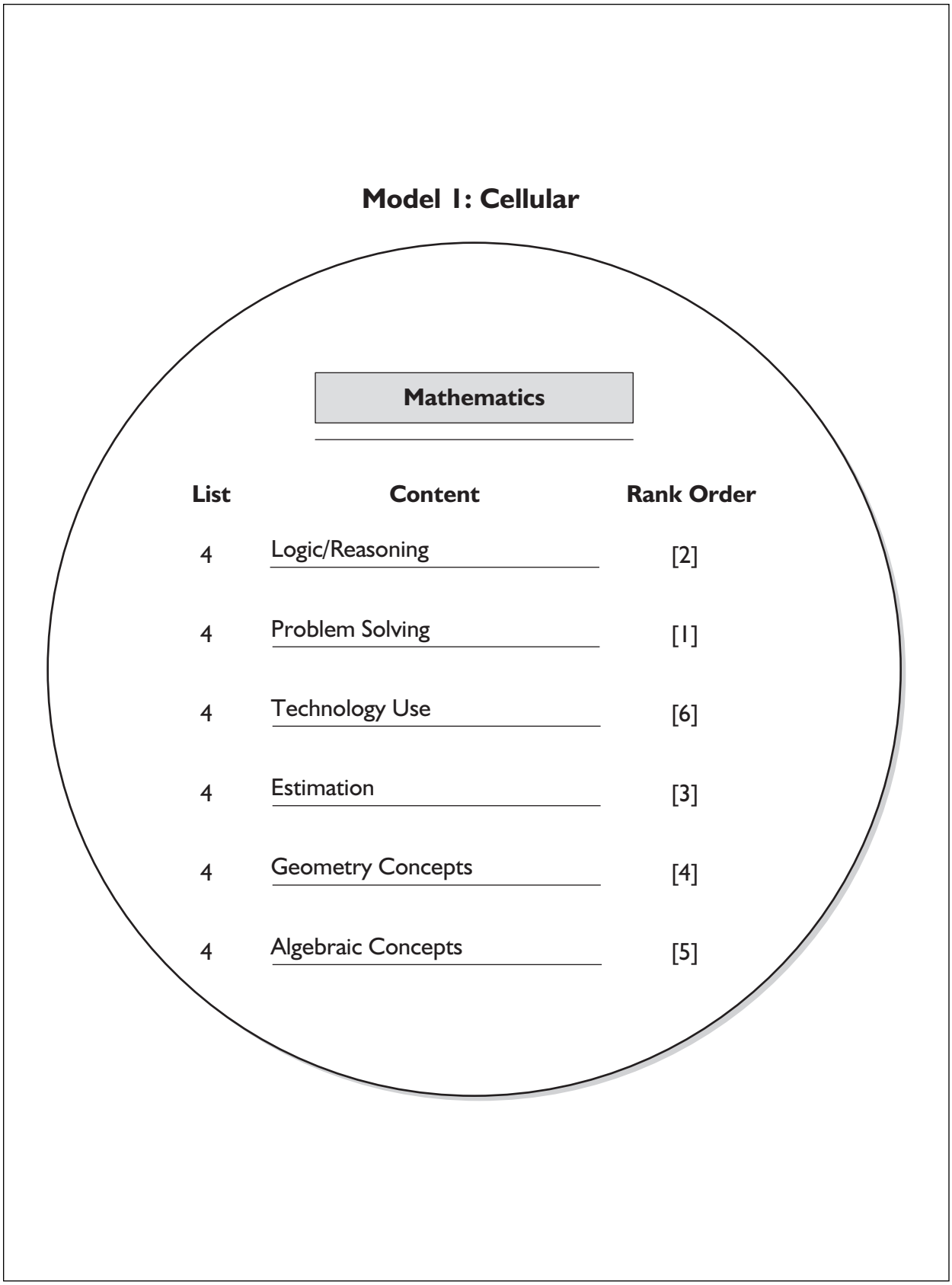


Figure 1.2 Middle School Example

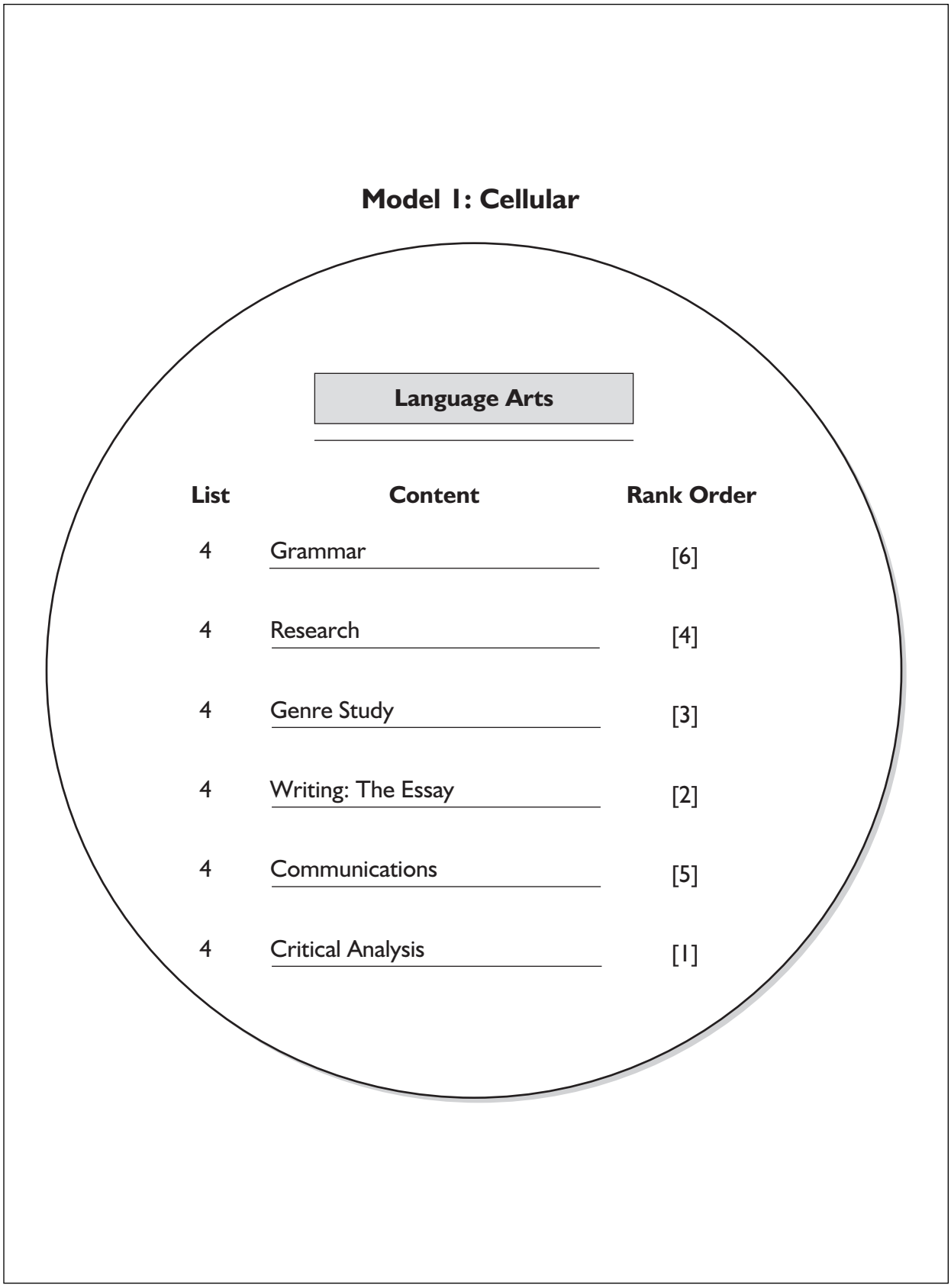


Figure 1.3 High School Example

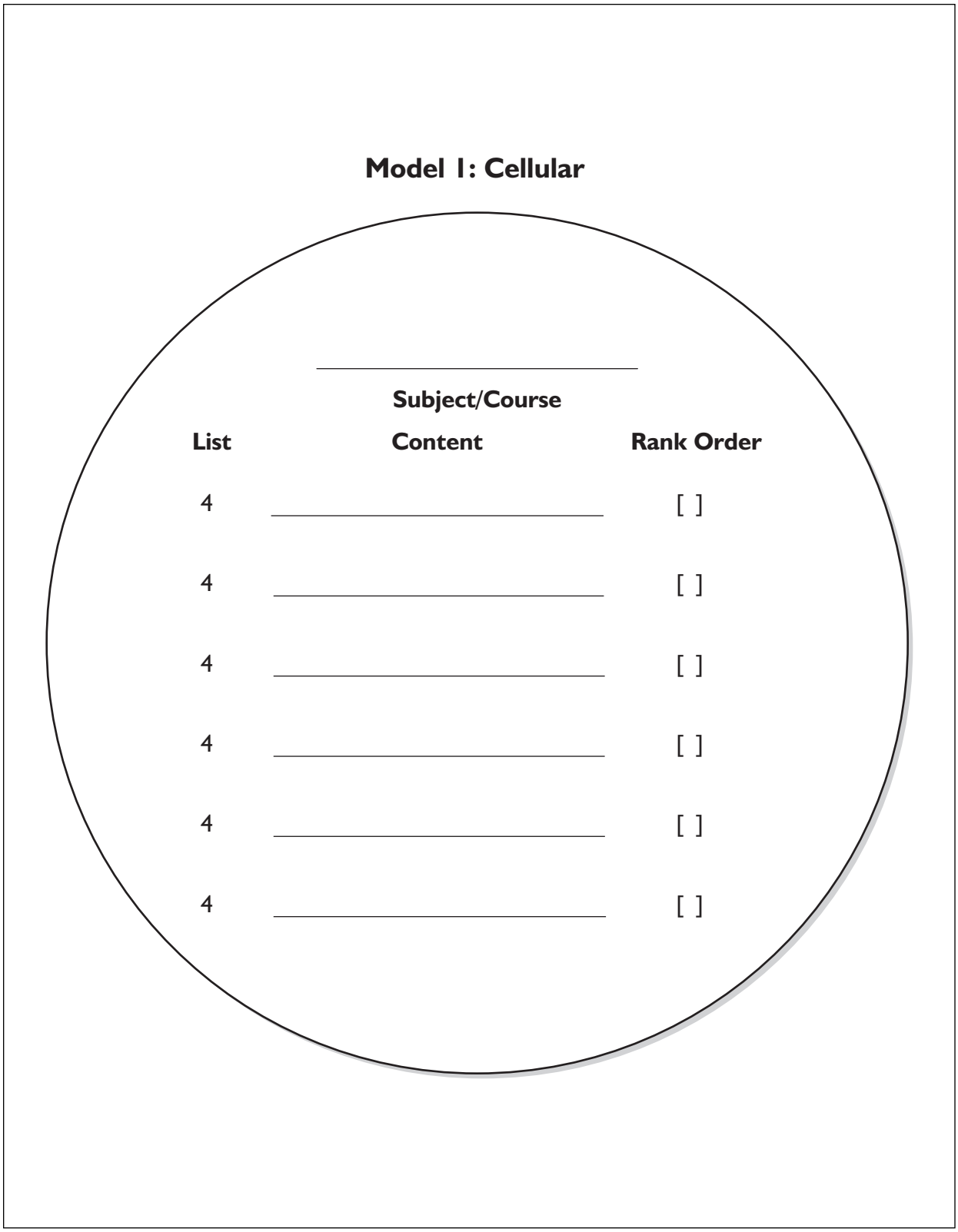


Figure 1.4 On Your Own

Notes & Reflections

Model 1: Cellular

Essential Reasoning:

> *"I prioritize the fundamental or basic understandings first; then I look for the topics, concepts, or units that can be given a different weight."*

Each teacher in each discipline plans the topics and content in isolation from the other teachers in other disciplines. For example, the language arts teacher and the science teacher simultaneously list their traditional topics for a semester, yet they do so independently of the other disciplines.

This cellular model is truly the traditional way of working with curriculum, with little or no attention to integrating the disciplines. Yet the sequence and time allotment determined by each individual teacher, using individual criteria, is a necessary step in sifting out curricular priorities. It is the first step in how teachers set about "selectively abandoning" or "judiciously including" (Costa, 1991a, p. 65) material in curricular design.

"In third-grade math, I prioritize mathematical operations as the fundamental or basic understandings first; then I look at geometry and probabilities because I can give them a different weight in the grand scheme of things."