

Curriculum Structure

Learning at Q2L occurs via an innovative model that situates the acquisition of specific skills and ways of knowing within Discovery Missions, or challenge-based problem sets. This chapter describes the structure and rationale behind Discovery Missions, concluding with a curriculum template to be used in support of their design.

Discovery Missions

The Q2L curriculum is delivered through central organizing structures known as Discovery Missions and Boss Levels, which together represent a common organizing principle for games. Students navigate each of the Integrated Domains described in “Curriculum and Instruction” through immersion in complex, interdisciplinary problems that require students to gain standard-based skills and fluencies in order to solve them. In traditional terms, Discovery Missions represent a *unit* of study.

Each 12-week semester is divided into two parts: Discovery Missions, which last 10 weeks; and Boss Levels, which run during

the last 2 weeks of a semester, providing a 2-week “intensive.” In a Boss Level, students and teachers work collaboratively on a capstone project that integrates ways of knowing experienced within the previous 10 weeks. A Boss Level acts as a kind of a “space of defense”; students draw on an inventory of acquired content, processes, resources, and relationships to overcome a final challenge. During this time, students participate in a rigorous process of research, theory building, hypothesis testing, evaluation, and critique—all followed by a public defense of results. Student-led teacher conferences take place at the end of the semester, allowing students, teachers, and parents/caregivers to review student achievement and progress together.

All Missions are designed to get students to

- Reflect on what they know how to do now and what they need to learn how to do in order to complete the Mission successfully.
- Gather data and manipulate resources.
- Create inferences.
- Theorize and generate solutions.
- Evaluate results.

The Way Things Work	synthesizing context
Being, Space, and Place	
Codeworlds	
Wellness	
Sports for the Mind	
10-week Missions	2-week Boss Level

Quests

Each Discovery Mission is made up of a series of smaller Quests, or goal-oriented challenges that equip students with necessary data, knowledge, resources, and practices to solve the larger Mission. In traditional terms, Quests are like subunits of a larger unit of study.

Quests are designed as active “data expeditions”: students collect information and resources of different types (scientific data, writing, statistical or economic data, physical samples, etc.). Students then manipulate, analyze, and shape these data in ways that allow them to gain expertise in the standards defining the knowledge core of each domain. For example, sixth-grade students on a Discovery Mission within Being, Space, and Place may be required to find definitions of key terms hidden with the html of Web pages distributed across the Internet. In completing this Quest, students have to learn the basic syntax of HTML, become fluent in the use of search engines, and learn how to assess the credibility of sources. Once gathered, the key terms form the basis of vocabulary, reading, and comprehension work. The Quests’ structure, enabling spiral, and fit to the larger goals of a Discovery Mission provide the vehicle for student self-assessment about “what they need to know” and “how to find out” and for teachers to gather assessment data based on evidence of their achievements in situated contexts.

Missions contain from 4 to 10 Quests, which vary in length and complexity. A Quest is designed for completion either by individuals or by students working in small teams. Students know a Mission’s goal before it begins. As the school gains upper

grades, part of the curriculum will involve the design of Quests by the older students for the lower grades.

Examples of Things Students Might Do as Part of a Quest

- Analyze 20 Wikipedia pages.
- Go to a local deli to collect pricing information on various fruits and set up Excel spreadsheets to organize the data.
- Work with an online telescope to gather data on star types or positions.
- Send text messages to relatives about family histories.
- Go to a museum to explore the details of an exhibition.
- Talk to experts or their neighbors and record oral histories.
- Read a text and pull out key ideas.
- Take apart a bicycle to locate a key component.
- Use various resources to break a secret code.
- Do a science experiment.

Types of Quests

The following list includes different kinds of Quests that can be used in the design of Discovery Missions. The list will expand over time as further work is done with the Q2L curriculum model.

- *Collect Quest* Goal is to collect/harvest x resources.
- *Puzzle Quest* Goal is to solve a problem (might also be called a Code Cracker Quest).
- *Share Quest* Goal is to share x resources.
- *Drama Quest* Goal is to enact a system or behavior.
- *Conquest* Goal is to capture a territory or resource.
- *Grow Quest* Goal is to increase the number of resources in a system.

- *Shrink Quest* Goal is to decrease the number of resources in a system.
- *Maze Quest* Goal is to find a way through a space (about navigation).
- *Story Quest* Goal is to create a story.
- *Delivery Quest* Goal is to deliver x resources.
- *Seek and Destroy Quest* Goal is to eliminate something (e.g., eliminate all misspelled words from a document).
- *Spy or Scout Quest* Goal is to observe and gather information and report back.
- *Research Quest* Research a question and return with the answer. This research might take any number of forms, from questioning friends and teachers for viewpoints to reading books in a virtual library to deciphering runes and hieroglyphs.
- *Design Quest* Goal is to make something to be used in the Quest.
- *Apprentice Quest* Goal is for a player to assume the duties of an expert character in the game after having learned about what this expert does.
- *Tracking Quest* Goal is to track something and report back on its movement or change.
- *Experiment Quest* Goal is to find the results of a scientific experiment.

Structure of Boss Levels

Students within a section organize into teams and create a response to a final challenge. As a section, the students together create a set of criteria to evaluate the teams' outcomes and vote later for a single solution the section wants to put forward for final judging against solutions from other sections. Sections

have the opportunity to spend one or two days improving the selected solution before the final judging. Students are selected on a random and rotating basis to sit on the final judging panel. All solutions are shared within a public forum, with the results of the mission celebrated. Student-led parent-teacher conferences take place at the end of a mission, allowing students to reflect on their work and share their process with their parents.

At the end of semester's Missions and their culminating Boss Levels, a seminar is held with teachers and the advisory board to look at outcomes for the semester. This seminar is moderated by the Institute of Play and serves as a tool for professional development and as a way to maintain the school's vision across a range of stakeholders.

Key Values

- The lack of something becomes a key to solving the Mission: Quests may be designed so that at the beginning students lack needed resources or skills and must acquire them to gain expertise in order to proceed. For example, students may initially lack the ability to convert fractions into decimals, a skill required by a Mission. This lack will encourage students to discover this skill as something they need to learn how to do and will help motivate them to acquire this particular way of knowing.
- Students learn to do something as a *means* to solve a Quest (i.e., "I am learning fractions because I need to know how to work with them in order to address an aspect of the Quest I am working on.")
- If students have difficulty with a Quest, there will be an opportunity for a teacher to redesign the Quest with the students and have them replay it.

Archiving and Documentation of Quests

Discovery Missions, Quests, and Boss Levels provide a curricular infrastructure for building partnerships with external organizations. For example, we might work with the Natural History Museum to build a series of Quests that engage their collections. These Quests will be documented and archived so that teachers can access, share, and use them in different ways each year.

Technology Integration

Q2L's technology integration considers purpose and pedagogy in developing appropriate and affordable technology solutions. The primary educational goal is to integrate technology effectively into the classroom with the purpose of adding breadth and depth to all students' educational experiences. The nature of our academic technology integration is linked directly to Q2L's curriculum and learning objectives. Learning environments that successfully integrate technology afford their students greater opportunities to create and construct knowledge; they also provide teachers with multifaceted resources to aid in the differentiation of curricula. Educational technologies allow students new means of demonstrating their understanding. Students can express themselves as researchers, designers, filmmakers, photographers, songwriters, and engineers. These new means are compelling and assist in the development of skill sets necessary in contemporary professions. Modeling best practices, technology personnel support the classroom teachers' efforts, enabling the teachers to become self-sufficient technology integrators.

What is technology integration, though? Like screwdrivers or space shuttles, high-tech hardware and software are most useful

when used for clearly defined purposes. Their power can be unleashed only if we also pay sustained attention to curriculum, school organization, educational philosophies, instructional practices, family and community involvement, and the other components of successful schools.

Educational technology is used as a tool to deepen a student's understanding of a particular subject, concept, or skill and to foster communication within the school and beyond. Applications are chosen based on their ability to model or extend the thinking or problem solving that is central to the classroom. At times, technology is used to imitate what is being done in the classroom, thus reinforcing learning and oftentimes allowing students to move further forward to enhance learning.

Technology integration takes shape in the Q2L classroom in various ways. We provide tools that allow classrooms to collaborate effectively and to produce compelling lessons. Our model designates the classroom teacher as the party responsible for ensuring that the use of technology is compelling and in context. Teachers also act as a front line of support for the technology present in their classroom. The role of the technology group will be to support this approach, scaffolding teachers and thus allowing them to integrate technology ubiquitously and intimately into their work with students.

Q2L technology integrators serve as mentors in both technology and teaching. They support teachers individually and model best practices with technology in the classroom. The support of technology integrators affords teachers successful experiences with technology, which often means that the integrators are in the classroom (virtually or physically) for the duration of Missions and Quests they have helped to plan. Any work they do

with teachers is borne of the teachers' own content and style, which allows the teachers a deep connection to and ownership of the project. Individualizing this approach to technology is a key facet to its success with teachers.

Discovery Mission and Quest Design

Discovery Mission and Quest design entails collaboration between teachers, on the one hand, and game design and learning experts in residence at the Institute of Play, on the other. Teachers, working in teams, establish a set of standards, core content, and assessment methods for each unit. Designers from the Institute of Play then work with the teachers to translate this material into Mission and Quest form. Three planning sessions per week are dedicated to this work, and semiannual retreats allow for planning and development.

Discovery Mission Curriculum Template

Box 1

Mission Blurp

Write a short paragraph that describes in simple terms the main problem space students are being dropped into: What is the primary dilemma or problem? What identities or roles will they take on? What does this Mission challenge the students to do, learn, and explore?

Mission Narrative

Write a short paragraph that describes the narrative framing the Mission. The narrative should focus on the "need to know" (i.e., what students need to know) and should provide a clear description of where the students fit into the narrative. This description can be accompanied by a bulleted list of the narrative's core elements.

Box 1

(continued)

Deliverables

Include a bulleted list of possible deliverables that can be developed as part of the Mission.

Assessment

List the types of evidence and tools to be used to maximize documentation of student progress and understandings at formative and summative stages of this Mission (for example: “The following competencies will be evaluated in this Mission: . . .”).

Mission Structure

What structure do you think the Mission will take? Will it contain certain stages, phases, or chapters? Does it have a part 1 and a part 2, with a culminating Quest? Is it made up of a series of Quests of similar length? This description will be speculative at first because the details will likely change, but do your best to offer a sense of how the Mission might be structured as a learning sequence.

Overview of Quests: Quick Sketches of Ideas

Create a one-sentence blurb for a series of Quests that you think might make up the Mission. Each quest should have a working title and give a snapshot of the Quest’s goal: What are students going to do, and why?

Quest 1: [Title]

Quest Description:

Quest is complete when:

Length:

Essential Question:

Big Idea:

Core Competencies Covered:

Content Covered:

Knowledge:

Skills:

Possible Learning Activities:

Learning Strategies How are the following to be created for the student?

Need to Know What “need to know” does the Quest create?

Collaboration What need does the Quest create in students that requires the sharing of concepts/practices?

Box 1

(continued)

Opportunities for Sharing What occasions are presented for sharing and reflection during the Quest?

Reflection What contexts does the Quest create to enable sharing and reflection?

Feedback and Validation How do students receive feedback and validation on their progress in a Quest?

Dissemination What channels are activated for dissemination of Quest solutions?

Continuum of Quest Knowledge Assessment

What assessment evidence and tools are needed to support a formative-summative learning cycle?

1. Planning the Quest

What student prior knowledge and experiences—here or elsewhere—can be used to plan the Quest? To kick off the Quest?

2. Doing the Quest

What criteria and tools are particularly apt to capture in situ learning? What criteria will be used to judge the validity and effectiveness of Quest solutions (e.g., speed of solution, creativity or innovation, effectiveness of resource, etc.)?

3. Culminating the Quest

What summative criteria, evidence, and parallel experience forms support judgment about the level of student learning and achievement?

4. Culminating Mission Fluency Assessment

What summative evidence demonstrates student learning on a trajectory from novice to expert fluency?

Teacher's Self-Assessment of Mission Results

Cohesion Do Quests fit with the Mission's overarching goal? Is the unit sticky?

Construct Does the Mission structure and its Quests enable students to meet the Mission's stated knowledge domain and standards outcomes?

Scaffolding How did I support student learning given time, place-space, resources, pedagogy, levels of learning (novice-to-expert assessment of progress), and evaluation of learning outcomes?

Revisioning What needs further thought and iterative design for next time? Why?

Curriculum Directors' Planning Template

Box 2

I. Mission Overview

Overview of Mission Design

What is the purpose of the Mission, key moments in the mission, goals for students learning, and preparation for Boss Level requirements?

Core Understandings (Big Ideas)

What are the enduring understandings? They should include content, domain, and game design/system understandings.

II. Mission Accomplished: Preparation for Future Learning

What evidence will be collected to determine whether the core understandings have been developed, the knowledge and skills attained, and the state standards met? (Anchor the work in performance tasks that involve application, supplemented as needed by prompted work, quizzes, observations, and so on.)

Essential Questions Explored in the Mission

What arguable, recurring, and thought-provoking questions will guide the inquiry and point toward the Mission's big ideas?

Knowledge and Skills

What are the key knowledge and skills needed to develop the desired understandings?
 What New York State standards are addressed in the mission?
 What knowledge and skills relate to the content standards on which the Mission is focused?

Assessment Strategies and Culminating Assessment

What types of evidence and tools will be used to maximize documentation of student progress and understandings at the Mission's formative and summative stages?

Pedagogy: Learning to Be

What identity and behaviors are students stepping into?
 How does the mission create:
 1. A need to know for students?
 2. A need to share between students?
 3. Opportunities for feedback and reflection?

Box 2

(continued)

III. Mission Quests: Learning and Assessment Plan

What is the assessment and learning plan for each Quest?

Quest Overview

What is the Quest's goal, and how does this Quest enable students to complete ongoing and cumulative assessment successfully?

Focusing Question

What is the primary question guiding the Quest? How does this question create a space of inquiry for students?

Assessment and Feedback

What are the assessment and feedback tools for the Quest?

Resources

What smart tools will students use to complete the quest?

Challenge Posed

What is the key challenge students will be asked to solve?

Learning Plan

What sequence of learning experiences will enable students to engage with the core understandings successfully?

Data Set Created, Collected, or Used

What type of data set(s) is at the core of the Quest? How will students use these data to meet the Quest's goals successfully?

Scenarios for Potential Uses of Gaming

Students at Q2L play and design games. While they are gaming, they pay explicit attention to the status of games as dynamic learning systems, as rule-based models supporting specific ways of knowing and doing. Beginning in the sixth grade and continuing through the twelfth grade, students gain practice each day in reflecting on the process and practices of learning. Games and the playing of them serve as their primary resources.

Rather than thinking about games and their play generally, however, both students and teachers at Q2L use games in many different ways to support different intentions and purposes.

Games as “Engines” or Authoring Platforms: Authoring Systems

In this scenario, students use games to produce an artifact, be it a game (*Gamestar Mechanic*), a mod (*Starcraft*), a video (machinima in *WOW*, *SimCity*, *Second Life*, etc.), a visual text (*Sims Family Album*), an avatar (*Miis*), a written text (*7Scenes*), or a body of code (*Alice*, *Scratch*). Rubrics for evaluation of these artifacts come not from the game, but from the design domain to which the artifact is related and from the kinds of understandings the artifact was produced to express. Commercial off-the-shelf games, Web-based games, and software platforms or virtual worlds can be used.

Games as Content: Content Systems

In this scenario, commercial off-the-shelf or other games are used to deliver understanding about a particular subject or content area. For example, students play *SimCity* to learn about urban planning or *Civilization IV* to learn about history. When games are used this way, students must be provided with opportunities for reflection on and discussion of the content in spaces external to the game in order to allow them to see the game as part of a larger body of knowledge on that subject.

Games as Simulations: Manipulating Systems

In this scenario, games are valued as dynamic systems with which students can test theories about how systems work as well as how certain principles of dynamic systems can be observed and played out. For example, students may play *Bridge Builder* to learn about bridges as systems of engineering or use *Soda Play* as a way to test out physics-based theories. They might play *Animal Cross-*

ing in order to work with elements of a capitalist economy or theater games to reenact situations or scenarios as a way to see how the system can be affected by manipulating certain elements. Simulations often include their own internal assessment measures (data) that can be used to gauge student understanding of both micro and macro elements. Commercial off-the-shelf games, Web-based simulation tools, and downloadable software can be used.

Games as Context: Trigger Systems In this scenario, games are used to create an experiential context for understanding around a topic, issue, or principle that a teacher can build on. For example, a math teacher might have students play *Mafia* as a way to have them experience an ethical dilemma or *Pictionary* as a way to introduce ideas about forms of communication. When games are used this way, students must be provided with opportunities for reflection on and discussion of the content in spaces external to the game in order to allow them to see the game as part of a larger body of knowledge on that subject. Depending on the amount of time available, commercial, casual, and nondigital games can be used. This approach can be paired with the use of games as engines: students can be asked to design a game as a way to become immersed in research around a topic. Later learning experiences can then build on what was learned in order to build a game.

Games as Technology Gateways: Gateway Systems In this scenario, games are used as a way to give students experience with technology, whether it be in learning how to use a particular

piece of software or platform (i.e., how to use a personal computer or a browser) or learning how to use a kind of technology (a mobile phone, wireless device). Assessment models are based on a student's effectiveness with and ability to use the system to do what he or she wants it to do.

Games as Illustration: Reflective Systems In this scenario, games are used as contexts for student reflection. For example, a teacher might ask students to play a game and then discuss the choices they made: why did they choose that avatar skin over another one? Why did they choose to attack that country and not another one? What made them uncomfortable, and what were they surprised at having chosen to do? Commercial off-the-shelf, Web-based downloadable games, and board games can be used.

Games as Exemplars of Point of View: Point-of-View Systems In this scenario, games allow students to take on certain identities and associated points of view. Students might play a role-playing game where they have to choose to play both a "good" and "bad" character and compare differences in strategy, choice, and values held by those characters. A teacher might ask students to use a theater game to reenact a familiar scenario from several different points of view, with each character's goal being to shift the outcome of the scenario in his or her favor.

Games as Codeworlds: Code Systems In this scenario, students use writing as the primary mechanic of game play, whether they are playing text adventures or designing or playing text-

based mobile games. The emphasis here is in the use of writing as both a mode of action and a mode of expression. Because writing itself is produced as an artifact of the game play, this writing can be assessed to capture student understanding. There is an opportunity to connect this approach to games with the introduction of a programming curriculum that might use authoring platforms, such as *Scratch* or *Alice*, or virtual worlds that support object creation, such as *Second Life*.

Games as Documentary: Documentary Systems In this scenario, the play of a game is used as documentary evidence of student ideas and understanding. For example, students may be asked to play *SimCity* in such a way as to re-create certain social scenarios that they are interested in. Machinima or storyboarding with screenshots can be used to capture the details of the situation, which then can be used as the basis for additional discussion or reflection. Commercial off-the-shelf and Web-based downloadable games can be used.

Games as Text: Ideological Systems In this scenario, games are “read” as texts that express certain underlying ideologies, values, beliefs, and so on. In the same way that *Uncle Tom’s Cabin* can be read as an expression of the antebellum South, *Animal Crossing* can be played and analyzed as an expression of late-twentieth-century capitalism, *Chess* can be played and analyzed as a game about territorial conflict, and *Diplomacy* can serve as a model of the intricacies of international diplomacy. When games are used this way, students must be provided with opportunities for reflection on and discussion in spaces exter-

nal to the game and ideally in relation to other media. Commercial off-the-shelf, Web-based downloadable games, board games, and other kinds of nondigital games can be used.

Games as Research: Research Systems In this scenario, students design games as a research activity that produces material to be used in later learning experiences. Because a designer must be knowledgeable about the system he or she is designing, using game design in this way requires students to think through how their players are learning and what they need to know about the subject of the game. In this way, students not only research material to be used, but also edit this material and are introduced to issues around credibility and point of view. Different kinds of research methods can be introduced as part of the work as well.

Games as Assessment: Assessment Systems In this scenario, games can be used as environments for assessing student learning of curricular content or state standards. For example, students might play *Quest Atlantis* to show their understanding of certain science concepts, or they might play a *7Scenes* game that centers on answering questions around certain content.