Unit 2 Games

Content Area: **Computer Science**
Course(s):
Time Period: **Marking Period 1**
Length: **20 days**
Status: **Published**

Summary

Unit 2 extends the computational thinking (CT) vocabulary students built in Unit 1 — algorithms, conditionals, and debugging — into the study of games as systems, using Dungeons & Dragons 5th Edition (with beginner guardrails) as the vehicle. Over twenty 40-minute periods, students move through three phases: they first experience D&D as players (Days 1–6), learning that the game is a rules-governed system with inputs, randomness, and consequences, and that different character classes approach the same problem in different valid ways; they then shift to analysts (Days 7–12), deconstructing encounters into their component parts (setting, conflict, obstacles, solution paths, consequences) and examining the same scenario from the player's, the DM's, and the designer's point of view; and finally they become designers (Days 13–20), each writing an original encounter with at least three distinct solution paths, revising it based on structured peer feedback, and running it live as Dungeon Master for a small group of classmates. The throughline across all three phases is perspective-taking: a well-designed system anticipates that different people will approach the same problem differently, and a well-designed encounter survives players doing something the designer didn't plan for. The unit closes with a three-part final assessment — the written Encounter Design Document, the live-run performance, and a post-run written reflection — that mirrors the individual-work → partner/group-testing → written-reflection structure of the Unit 1 capstone.

Revision Date: July 2026

Essential Questions

- How does a game function as a system with rules, inputs, and consequences — and how is that similar to, or different from, an algorithm?
- Why do different people, or different character classes, approach the same problem in different, equally valid ways?
- What is the relationship between randomness and strategy, and how does each shape the outcome of a decision?
- What must a designer anticipate in order to create an experience that works well for someone other than themselves?

Enduring Understandings

- Games are systems governed by rules; understanding a system from multiple perspectives — player, Dungeon Master, and designer — reveals design decisions and trade-offs that are invisible from any single viewpoint.
- Designing an experience for other people requires anticipating their choices, including choices the designer did not intend, and improving the design through structured feedback and live testing rather than assuming a first draft will work.

Objectives

Students Will Know

- Students Will Know how D&D functions as a system built on a core loop: describe, decide, roll, consequence.
- Students Will Know the identity and approach of each of the six simplified character classes (Fighter, Wizard, Rogue, Cleric, Ranger, Bard) and how class shapes the way a problem gets solved.
- Students Will Know the basics of probability and randomness, including what a d20 roll represents and how advantage/disadvantage shifts outcomes.
- Students Will Know the five components of an encounter: setting, conflict, obstacles, solution paths, and consequences.
- Students Will Know the concept of encounter balance, including a simplified understanding of Challenge Rating (CR).
- Students Will Know the difference between a player's perspective, a Dungeon Master's perspective, and a designer's perspective on the same encounter.

Students Will Be Skilled At

- Students Will Be Skilled At making strategic, in-character decisions within a rules-bound system.
- Students Will Be Skilled At analyzing an encounter to identify its component parts and key decision points.
- Students Will Be Skilled At mapping multiple solution paths — combat, social, and creative — for a single problem.
- Students Will Be Skilled At designing an original encounter with a clear setting, a central conflict, at least three distinct solution paths, and defined consequences for each path.
- Students Will Be Skilled At giving and incorporating structured peer feedback, including identifying an unintended solution path or an imbalance in another student's design.
- Students Will Be Skilled At running (DMing) a live encounter for a small group and adapting fairly

and consistently when players act outside the plan.

- Students Will Be Skilled At reflecting in writing on what worked, what broke, and where a Unit 1 computational thinking skill showed up in their design or gameplay.

Learning Plan

Unit 2 uses real 5e rules with beginner guardrails rather than an invented system: students choose from six pre-built character sheets instead of building from scratch, spellcasters work from a curated list of four to five spells, only the core roll-plus-modifier and advantage/disadvantage formula is used, and each turn is bounded to one action, one bonus action, and one movement. This keeps the game recognizably real while removing the parts that overwhelm beginners, and it lets the unit stay focused on systems thinking rather than rules memorization.

Phase 1, Learn the System (Days 1–6), introduces students to D&D as players. Days 1–2 cover what D&D is and how its core loop works, walk through the six character sheets as a class, and let students select and get familiar with their own character establishing the framing that “your character is a lens; different lenses see the same problem differently.” Days 3–5 run a teacher-led campaign of three short encounters, each engineered to show the same core problem solved multiple ways: a straightforward combat encounter that teaches the action economy, a social/negotiation encounter that can't be solved by fighting and pulls spellcasters and Charisma-based characters to the front, and a puzzle/exploration encounter with no obvious enemy that requires creative thinking. Each encounter is debriefed as a class, surfacing how differently students approached the identical scenario. Day 6 turns to probability and randomness directly: students roll a d20 twenty times, track the results, and discuss whether the dice ever made a good plan fail or a bad plan succeed, landing on the framing that randomness doesn't replace strategy, it adds stakes to it.

Phase 2, Analyze and Deconstruct (Days 7–12), shifts students from players to analysts. Day 7 revisits all three Phase 1 encounters from the Dungeon Master's chair, breaking each into its components and asking what decisions the DM had to anticipate in advance. Days 8–9 formally introduce the five-part encounter design framework students will use for their own capstone setting, conflict, obstacles, solution paths, and consequences and small groups apply it to two pre-built encounters before presenting their analysis to the class. Days 10–11 push the multiple-perspectives lens further: the same encounter is read three ways (as a player asking “what are my options,” as a DM asking “what do I need prepared,” and as a designer asking “what would break this”), and small groups are challenged to map every possible solution path to a scenario, including ones the original designer didn't intend. Day 12 introduces encounter balance and a simplified version of Challenge Rating, with students evaluating three pre-rated encounters (Easy, Medium, Hard) and discussing what separates them.

Phase 3, Design and Run (Days 13–20), moves students into the Dungeon Master's seat. Days 13–14 are a structured design workshop in which students draft their own original encounter using the Phase 2 framework, meeting requirements that include a setting with at least one mechanically relevant environmental detail, a central conflict with at least three distinct solution paths, defined consequences for each path, and at least one moment that plays out differently depending on which character class is leading; the teacher conferences

individually with each student before designs are finalized. Days 15–16 are peer review and revision: students swap designs with a partner whose job is to find a fourth, unintended solution path or flag anything unbalanced or unclear, and designers revise based on that feedback the debugging phase of encounter design. Days 17–19 are live play: teacher-assigned groups of three to four students rotate through encounters so that every student both DMs their own encounter and plays in others. Strategic grouping matters here — groups should mix character classes so a range of approaches is available, separate students who might dominate or disengage from each other, and guarantee every student gets both a DM turn and a player turn. Day 20 closes the unit with individual written reflection and a whole-class debrief on what broke, what surprised students, and where Unit 1 algorithms, conditionals, and debugging vocabulary showed up in their D&D design or gameplay.

Assessment

Formative Assessment

Whole-class debriefs after each Phase 1 encounter (Days 3–5) surface how students' approaches differed and check understanding of the core loop. The Day 6 probability-tracking activity and discussion function as a formative check on students' intuitive grasp of randomness. Phase 2 small-group framework analyses and presentations (Days 8–11) let the teacher observe whether students can apply the setting–conflict–obstacles–solution paths–consequences framework before they must use it independently. Teacher conferences during the Days 13–14 design workshop catch structural problems before a design is finalized.

Summative Assessment

The unit's summative assessment is a three-part Final Assessment. Part 1, the Encounter Design Document (40%), is the written encounter submitted before running, graded on completeness of the five-part framework, the quality and distinctiveness of the three solution paths, and evidence that multiple player perspectives were anticipated. Part 2, Running the Encounter (35%), is scored through teacher observation of each student DMing, graded on the ability to adapt when players go off-script, fairness and consistency in applying rules, and how well the encounter played out relative to how it was designed. Part 3, the Post-Run Reflection (25%), is a short written response addressing where the encounter first diverged from plan, which solution path players actually used and whether that was a surprise, what the student would change if they ran it again, and where a Unit 1 CT skill showed up in the design or gameplay.

Benchmark Assessment

As with Unit 1, this pilot elective does not draw on an existing district-wide diagnostic. The department may consider extending the locally developed computational thinking pre/post skills check proposed in Unit 1 to include systems thinking and probability items, allowing growth to be benchmarked across both units.

Alternative Assessment

The Days 15–16 peer review protocol is itself a performance-based alternative assessment: a reviewer must actively test another student's design by attempting to find a solution path the designer didn't plan for, which

requires applying the same systems-thinking skills being assessed. The Day 20 written reflection functions as a metacognitive self-assessment component, similar in spirit to the Debug Report in Unit 1.

Materials

Core Instructional Materials

- Six pre-built, simplified character sheets (Fighter, Wizard, Rogue, Cleric, Ranger, Bard) with stats pre-filled
- Teacher-run campaign scripts for three Phase 1 encounters (combat, social/negotiation, puzzle/exploration)
- Encounter Design framework handout (setting, conflict, obstacles, solution paths, consequences)
- Encounter Design Document template (student capstone submission)
- Peer Review protocol sheet (Days 15–16)
- Post-Run Reflection sheet (Day 20)
- Simplified spell lists (4–5 spells per spellcasting class)

Supplemental Materials

- Sets of polyhedral dice (at minimum d20) for classroom play
- Probability tracking worksheet for the Day 6 dice-rolling activity
- Simplified Challenge Rating (CR) reference guide for the Day 12 encounter-balance lesson
- Beginner D&D slide deck (Canva) — https://www.canva.com/design/DAGBfuVFcCA/0UJAk1DgpeTX136h1Uzklg/view
- “How to Play D&D” video playlist (YouTube) — https://youtube.com/playlist?list=PLJmFJXf3BXjwXkNFo_-iwtHb24AuJcXqx

Standards

Computer Science & Design Thinking (NJSLS-CSDT, 2020)

Code	Performance Expectation

8.2.8.ED.1	Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.
8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).
8.2.8.ED.4	Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.
8.2.8.ED.7	Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs.
8.1.8.AP.6	Refine a solution that meets users' needs by incorporating feedback from team members and users.
8.1.8.AP.8	Systematically test and refine programs using a range of test cases and users.

Career Readiness, Life Literacies & Key Skills (NJSLS 9.4, 2020)

Code	Performance Expectation
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.
9.4.8.GCA.2	Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.CI.4	Explore the role of creativity and innovation in career pathways and industries.

Interdisciplinary Connections — Mathematics (NJSLS-Math, 2023)

- 7.SP.C.5 — Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring (applied to Day 6 dice-rolling and probability discussion).
- 7.SP.C.6 — Approximate the probability of a chance event by collecting data on the chance process and observing its long-run relative frequency (applied to the Day 6 twenty-roll data collection activity).
- 7.SP.C.8 — Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation (applied to mapping multiple solution paths and outcomes in Phase 2).

Interdisciplinary Connections — English Language Arts (NJSLS-ELA)

- W.7.3 — Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences (applied to writing an encounter's setting and conflict).
- SL.7.1 — Engage effectively in a range of collaborative discussions, building on others' ideas and

expressing their own clearly (applied to encounter debriefs and in-character play).

- W.7.4 — Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience (applied to the Post-Run Reflection).

Integrated Accommodations & Modifications

Suggested Strategies for Modification for Computer Science