# Course Title:
Game Makers


# Length:
One Quarter
Grade 5


# Primary Content:
Gifted & Talented


# School:
Pierrepont


# Embedded Content:
English Language Arts, Math, Career Readiness, Life Literacies and Key Skills


# Initial BOE Approval Date (Born on):
June 24, 2024

**RUTHERFORD PUBLIC SCHOOLS**
**Rutherford, New Jersey**

**GIFTED AND TALENTED DEPARTMENT**

**GAME MAKERS - GRADE 5**

## 1.    Introduction/Overview/Philosophy

This scheme for the teaching and learning of numeracy through problem solving consists of a series of modules to introduce into the curriculum a component which enables students to link their mathematics to the real world in which they live. The unit is based on practical contexts which have been chosen to allow students to develop general problem solving (or strategic) skills in areas of activity such as designing and making, planning and organizing, and choosing. These strategic skills include:
• understanding general ideas and details
• following instructions precisely
• distinguishing between essential constraints and desirable features
• identifying faults
• correcting faults
• generating and listing viable possibilities (brainstorming)
• developing a rough plan, including: reviewing the prepared suggestions; reaching and recording agreed decisions; maintaining a broad level of description, avoiding excessive detail; identifying needed information and materials; making estimates of quantity and cost; describing, testing and evaluating the plan
• making the final plan, product and/or detailed instructions with comprehensiveness, accuracy, clarity and quality
• implementing the activity with full preparation
• testing and evaluating the plan or product comprehensively.

**Course Outline**

*Game Makers* can be adapted based on time and ability level of the class as a whole. The course will be broken into "modules" or units. The first module will be Design a Board Game: in which students design and produce a board game which can be played and evaluated by other members of the class. The second is Design an Escape Room: in which students design and produce an escape room (either virtual or real) which can be played and evaluated by other members of the class. Lastly, if time, Produce a Game Show: in which students devise, schedule, run and evaluate their own classroom quiz/game show.

The variety of enriching and thought-provoking learning experiences offered in the Gifted and Talented Program incorporates three levels of enrichment intended to promote critical thinking.

Type I—General Exploratory Activities (Content)- Exposure to disciplines, authors or events not covered in the regular curriculum. Children can be exposed to such areas long enough to be attracted to some of them for individual study.

Type II—Group Process Activities (Operations)- Students are taught skills for expanding their thinking and feeling processes. Among these activities are: brainstorming, analysis, classification, general inquiry, observation and evaluation.

Type III—Real Problem Solving (Products)- This type of enrichment involves children in thinking, feeling and doing in the manner of the practicing professional. Children are encouraged to focus on solvable problems so that they might become empowered to create products that influence outcomes and make a difference in the world.

In addition, a goal of the Gifted and Talented Program is to include activities aimed at developing the affective domain of our students, such as: valuing, responding, receiving/attending. It is through both thinking and feeling that our students will develop into thoughtful, contributing, valuable members of society.

**2.    Objectives**

Design a Board Game:
1. carrying out simple whole number and length calculations,
2. Estimating,
3. drawing simple figures, using drawing instruments appropriately,
4. understanding and using ideas of angle and parallelism,
5. Compute the probability of various outcomes
6. Compute probability for compound events
7. Convert fractions, decimals and percents to another form
8. Develop, analyze and explain the methods they used to solve problems
9. Communicate their mathematical thinking to peers
10. Use problem solving to alter a games 'fairness'
11. create original board designs,
12. writing clear, concise and complete instructions,
13. appreciating and using ideas of fairness and bias, randomness and variability
14. Understand and apply the design process

Design an Escape Room:
1. Write a captivating narrative
2. Understand and apply basic cryptography
3. Use technology
4. Write clear, concise and complete instructions
5. Understand and apply the design process

Design a quiz show:
1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and

potential impacts on people and the natural environment that may limit possible solutions.
2. Understand the skills and knowledge required in the G&T program
3. Use the design process to Empathize, Define, Ideate, Prototype, and Test
4. Write clear, concise and complete instructions
5. Understand different quiz/game show layouts/templates to determine the most effective structure for a classroom quiz show
6. Create the template, questions and host instructions for a class game show

## A.     Curriculum Objectives for Inquiry

Students will be able to refine and broaden
1. Divergent thinking
   a. Creative thinking
   b. Inventive thinking
2. Convergent thinking
   a. Deductive thinking
   b. Analytical thinking
   c. Evaluative thinking
3. Interpretive thinking
4. Research skills

1.     In the area of **divergent thinking** students will:
   a. use **creative thinking** to:
      1. use fluent and flexible thinking to brainstorm ideas/solutions
      2. develop, produce, and dramatize
      3. adapt story versions
      4. illustrate interpretations
      5. use the five-step writing process to write original pieces
      6. create and construct original designs with a variety of manipulatives and art supplies
   b. use **inventive thinking** to:
      1. use fluent and flexible thinking to brainstorm ideas/solutions
      2. adapt items to be used for an alternate purpose

2.     In the area of **convergent thinking** students will:
   a. use **deductive thinking** to:
      1. formulate predictions/hypothesis
   b. use **analytical thinking** to:
      1. analyze story elements
      2. compare and contrast story elements/manipulatives/interpretations
      3. interpret visual representations
   c. use **evaluative thinking** to:
      1. judge character traits and motivation
      2. compare, rate, rank, revise, and eliminate information
      3. determine cause and effect
      4. make conclusions about given information
      5. self-assess using set criteria

3.      In the area of **interpretive thinking** students will:
   a. use shared inquiry to:
          1. build awareness of interpretive issues in a story
          2. analyze character motivation and development

4.      In the area of **research skills** students will:
   a. access and select meaningful information using the Internet, books, videos, and other media
   b. use the five-step writing process of prewriting, drafting, editing, conferencing, and publishing for a variety of audiences and purposes
   c. use a variety of computer software to record research
   d. synthesize knowledge of a topic into self-selected culminating activities
   e. cite references
   f. Present to/share research with others

   **a. Skills**
          i.   Improvement of reasoning ability
          ii.  Development of creativity and personal development

## B.      New Jersey Core Curriculum Content Standards

SL.PE.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
SL.PI.5.4. Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
SL.UM.5.5. Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

W.SE.5.6. Gather relevant information from multiple valid and reliable print and digital sources; summarize or paraphrase information in notes and finished work, making note of any similarities and differences among ideas presented; and provide a list of sources.

5.DL.B.5 Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, ⅛). Use operations on fractions for this grade to solve problems involving information presented in line plots.

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process.

9.4.5.CI.1: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity.

9.4.5.CI.3: Research the development process of a product and identify the role of failure as a part of the creative process.

9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global

9.4.5.TL.5: Collaborate digitally to produce an artifact

## Career Readiness, Life Literacies, and Key Skills Practices

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These practices should be taught and reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.

| Practice | Description |
|---|---|
| Act as a responsible and contributing community members and employee. | Students understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good. |
| Attend to financial well-being. | Students take regular action to contribute to their personal financial well-being, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success. |
| Consider the environmental, social and economic impacts of decisions. | Students understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization. |
| Demonstrate creativity and innovation. | Students regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization. |
| Utilize critical thinking to make sense of problems and persevere in solving them. | Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others. |

| Practice | Description |
|---|---|
| Model integrity, ethical leadership and effective management. | Students consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others' action, attitudes and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals and organizational culture. |
| Plan education and career paths aligned to personal goals. | Students take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals. |
| Use technology to enhance productivity increase collaboration and communicate effectively. | Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks. |
| Work productively in teams while using cultural/global competence. | Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings. |

## 3.     Proficiency Levels

Students in grades five are identified as "Gifted and Talented." Students that have received 2 points on the Gifted and Talented screening will be offered all 4 available grade level courses.

Differentiating Instruction for Students with Special Needs: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Differentiating instruction is a flexible process that includes the planning and design of instruction, how that instruction is delivered, and how student progress is measured. Teachers recognize that students can learn in multiple ways as they celebrate students' prior knowledge. By providing appropriately challenging learning, teachers can maximize success for all students.
Examples of Strategies and Practices that Support
Students with Disabilities and Students with 504 plans
- Use of visual and multi-sensory formats
- Use of assisted technology
- Use of prompts
- Modification of content and student products
- Testing accommodations
- Authentic assessments

Gifted & Talented Students
- Adjusting the pace of lessons
- Curriculum compacting
- Inquiry-based instruction
- Independent study
- Higher-order thinking skills
- Interest-based content

- Student-driven
- Real-world problems and scenarios

English Language Learners
- Pre-teaching of vocabulary and concepts
- Visual learning, including graphic organizers
- Use of cognates to increase comprehension
- Teacher modeling
- Pairing students with beginning English language skills with students who have more advanced English language skills
- Scaffolding
- Word walls references
- Sentence frames
- Think-pair-share
- Cooperative learning groups
- Teacher think-alouds

### 4.    Methods of Assessment

A variety of assessments will be provided including, but not limited to, the following items:
Formal and informal teacher observations
Discussions
Teacher questioning and student oral responses
Performance assessments
Rubrics
Lesson assignments and records
Completed projects
Class presentations
Self-assessments
Peer evaluations
Homework
Writing Assignments
Group Projects, Presentations and Reports
Teamwork (participation, level of involvement, quality of work as a team member)
Sample collections/portfolios

### 5.    Grouping

Small group pull-out for students identified as "Gifted and Talented" according to the Rutherford School District Gifted and Talented Policy 2464 (revised December 7, 2020) to be run as a grade 5 cycle course.

### 6.    Articulation/Scope & Sequence

Course length is one quarter.

Major Products:
  a.  Planning and Design
  b.  Completed projects including physical game, escape room, quiz show

**7.  Resources**

a.  References
https://orise.orau.gov/resources/k12/documents/lesson-plans/design-a-game.pdf
https://reddoorescape.com/blog-the-process-of-designing-an-escape-room/
https://lockpaperscissors.co/escape-room-design-blueprint
https://www.weareteachers.com/build-a-classroom-escape-room-lesson/
https://juliannakunstler.coHow To Set Up and Run a Classroom Escape Roomm/vislit_boardgame.html
https://www.mathshell.com/publications/numeracy/boardgame/boardgame_teacher.pdf
https://www.mathshell.com/materials.php?item=boardgame&series=numeracy
https://www.instructables.com/Game-opoly-Designing-Building-your-own-Board-Ga/
file:///Users/aalmaliah/Downloads/Game%20Design%20Merit%20Badge%20Pamphlet.pdf
https://www.centerforarchitecture.org/k-12/resources/design-a-marble-maze-using-scrap-cardboard/
Breakoutedu.com

b.  Technology
Use of technology will conform to the New Jersey Student Learning Standards.
        Students shall use computers to complete research and for word processing.
Teachers shall use appropriate technology to enhance lessons.
         Students shall use computers for independent practice of developing skills and as part of the writing process.
        Students shall use computers as part of their project development or final escape room/quiz show.

c.  Supplies/Materials
a variety of art project supplies/paper
Markers/watercolor pencils/paint
Printer
Cardboard
Dowels
Tape
Plastic bottles
PVC
Shoeboxes
die, wheels, other misc objects for games
Locks
Handout for students
Cardboard boxes
X-acto knife and scissors
Paper towel tubes
Index cards

Breakoutedu escape room (physical and online)
d.      Texts
e.      Supplemental Reading

Supplemental readings and/or materials must be relevant and appropriate and related to the course content.  Any supplemental readings/materials will be used with teacher discretion and/or supervisor/administrator approval.

## 8.      Methodologies

Methods include but are not limited to:
• Cooperative learning
• Individual and group research
• Individual and group problem solving
• Inquiry
• Class discussion
• Brainstorming
• Critical Thinking
• Experimenting
• Short lecture

## 9.      Suggested Activities

• Skill-building activities
• Exploring multiple intelligences
• Researching
• Public Speaking
• Silent sustained reading
• Shared Inquiry discussions
• Close textual analysis

## 10.     Interdisciplinary Connections

The scope of materials for this Game Makers unit is broad and interdisciplinary. While rooted in STEM, designs can be (and normally are) constructed from real-world, local, and personal perspectives. The individual tasks and projects present requirements and problems to the students that are interdisciplinary in nature (Math, Computer research, ELA, Public Speaking). Students are also encouraged in creativity as they prepare their designs. As a team activity, Game Builders encourages individual responsibility and cooperation among team members.

## 11.     Professional Development

As per the PDP/100 Hours statement: the teacher will continue to improve expertise through participation in a variety of professional development opportunities. Specialized professional development for teachers in the Gifted and Talented Department is offered through the Bergen

County Consortium of Teachers of the Gifted (BCCTG) and the New Jersey Association for Gifted Children (NJAGC).  Teacher will continue to read professional journals and books.

## 12. Curriculum Map

| Unit Topic | Time Allocated | Differentiating Instruction for Students with Disabilities, Students at Risk, Students with 504 Plans, English Language Learners, & Gifted & Talented Students | Standards | Assessments |
|---|---|---|---|---|
| **Design a Board Game**<br>● The Design Process<br>● Research Games<br>● Present on Research<br>● Brainstorm Ideas<br>● Concept Design<br>● Sketch/Prototype<br>● Test/redesign<br>● Assess | 3-4 weeks | *For Support:*<br>● Scaffolding of materials and assignments<br>● Guidance from teacher and peers<br>● Group work<br>● Use of technology (speech to text)<br>● Information posted on google classroom for independent review<br><br>*For Enhancement:*<br>● Enhanced expectations for written and final assignments | SL.PE.5.1<br>SL.PI.5.4<br>SL.UM.5.5<br>W.SE.5.6<br>5.DL.B.5<br>3-5-ETS1-1<br>3-5-ETS1-2<br>3-5-ETS1-3<br>9.4.5.CT.1<br>9.4.5.CI.1<br>9.4.5.CI.3<br>9.4.5.CT.4<br>9.4.5.TL.5 | *Formative Assessment:*<br>● Strategic Questioning<br>● Monitoring Student Work<br><br>*Summative Assessment:*<br>● Creation of a Board game<br>(with testing) |

| Design an Escape Room | 4 weeks | *For Support:* | SL.PE.5.1 | *Formative Assessment:* |
|---|---|---|---|---|
| ● Understanding Escape Room Components<br>● Research Escape Rooms (Field Trip)<br>● Cryptography Mini-unit (Understanding basic ciphers)<br>● Brainstorm Ideas/Create theme<br>● Concept Design<br>● Sketch/Prototype<br>● Test/redesign<br>● Assess | | ● Scaffolding of materials and assignments<br>● Guidance from teacher and peers<br>● Group work<br>● Templates<br>● Use of technology (speech to text)<br>● Information posted on google classroom for independent review<br><br>*For Enhancement:*<br>● Enhanced expectations for written and final assignments | SL.PI.5.4<br>SL.UM.5.5<br>W.SE.5.6<br>3-5-ETS1-1<br>3-5-ETS1-2<br>3-5-ETS1-3<br>9.4.5.CT.1<br>9.4.5.CI.1<br>9.4.5.CI.3<br>9.4.5.CT.4<br>9.4.5.TL.5<br>W.SE.5.6 | ● Strategic Questioning<br>● Monitoring Student Work<br><br>*Summative Assessment:*<br>● Creation of an Escape Room (with testing) |
| **Design a Quiz/Game Show**<br>● Review G&T Skills that could be "tested"<br>● Brainstorm Ideas for layout (Jeopardy; password; $100,000 pyramid; relay race, etc)<br>● Concept Design<br>● Create questions; host instructions; etc.<br>● Test/redesign<br>● Assess<br><br><br>OR<br>**Design a Marble Maze**<br>● Review the qualities of a marble maze<br>● Concept Design<br>● Create a template/draft with measurements<br>● Build<br>● Test/redesign<br>● Assess | 2 weeks | For Support:<br>Scaffolding of materials and assignments<br>Guidance from teacher and peers<br>Group work<br>Templates of glider<br>Use of technology (speech to text)<br>Information posted on google classroom for independent review<br><br>For Enhancement:<br>Enhanced expectations for written and final assignments | SL.PE.5.1<br>SL.PI.5.4<br>SL.UM.5.5<br>W.SE.5.6<br>3-5-ETS1-13-5-ETS1-2<br>3-5-ETS1-3<br>9.4.5.CT.1<br>9.4.5.CI.1<br>9.4.5.CI.3<br>9.4.5.CT.4<br>9.4.5.TL.5<br>W.SE.5.6 | *Formative Assessment:*<br>Strategic Questioning<br>Monitoring Student Work<br><br>*Summative Assessment:*<br>Creation of final quiz show or game show (with testing of designs) |