8th Grade Talented and Gifted

Sayreville Middle School

Full year

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Course Overview

Statement of Purpose

The purpose of the 8th Grade Talented and Gifted Program is to challenge advanced students to become critical investigators, creative engineers, and capable project managers. Meeting weekly, this class pushes students to look past the surface of a problem, question assumptions, and learn from trial and error. Whether they are analyzing blood spatter patterns to reconstruct a scene or tracking a marketing budget to maximize book fair sales, students will practice using cold hard data to back up their choices. By connecting investigative science with real-world business leadership, we prepare our 8th graders to step confidently into high school and beyond.

Overview

The 8th Grade Talented and Gifted (TAG) Program is a weekly, project-based elective designed for students who have been identified using multiple measures who love solving mysteries, designing systems, and running real-world operations. The classes bridge the analytical world of crime scene investigation with the entrepreneurial side of event management. Students will use the Engineering Design Process alongside their creative, inventive, and deductive skills to crack forensic cases and master modern marketing. By the end of the year, our TAG students will transition from the lab to the business floor as they market, manage, and operate the school's Scholastic Book Fair.

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8th Grade Talented and Gifted

Content Area: **TAG**
Course(s): TAG
Time Period: Full Year
Length: 32 weeks
Status: **Not Published**

Section Title

TAG - Grade 8

Summary of the Unit

Eighth-grade students identified for the pull-out Talented and Gifted (TAG) program through multiple assessment measures will participate in weekly small-group enrichment sessions led by a district TAG teacher. These specialized learning experiences are designed to extend and enrich advanced learners' academic growth through engaging STEM challenges, higher-level critical thinking activities, creative problem-solving opportunities, and exploration of high-interest topics. Students will engage in hands-on science, technology, engineering, and mathematics (STEM) investigations, solve complex logic and reasoning challenges, and pursue student-driven projects and in-depth studies of unique areas of interest. Through these enrichment experiences, students will strengthen and apply advanced analytical, deductive, creative, inventive, evaluative, and visual-spatial thinking skills while fostering intellectual curiosity and independent learning.

Enduring Understandings

- Failure is an essential part of learning. It reveals flaws and provides the necessary data to make improvements.
- There is rarely a single right answer. Multiple successful solutions can exist for the exact same problem.
- Engineers work within constraints. Real-world designs always require balancing limitations like time, money, and materials.
- Design is a continuous loop. It constantly circles back to testing and refining.
- Feedback loops are critical. Peer critiques and user testing provide essential insights that the original designer might miss.
- Forensic science relies on physical evidence, which provides objective facts that are more dependable than human memory or eyewitness testimony.
- Locard's Exchange Principle: Every contact leaves a trace, meaning criminals always leave something at a crime scene and take something away with them.
- Evidence can either narrow a suspect pool down to a specific group or uniquely identify a single individual.
- Scientists use math, biology, and physics to reconstruct past events from visual patterns like blood spatters, bite marks, and fingerprints.
- Cryptography protects sensitive data by converting readable information into secret codes that require specific keys to unlock.
- Modern forensics requires teamwork among specialists in biology, chemistry, psychology, law, and computer science.
- Effective marketing requires understanding buyer preferences and matching promotional strategies to the interests of students, parents, and teachers.
- Running a retail point-of-sale system demands precision, accountability, and secure financial transactions to ensure inventory matches sales.

- Clear, eye-catching promotional materials directly influence consumer behavior and increase event attendance.
- Operating a successful community event relies on clear role delegation, active problem-solving, and professional customer service.

Essential Questions

- Why is it important to follow a design process when developing solutions to a design challenge?
- Why should we evaluate design solutions at intervals?
- What is the problem we are trying to solve, and why does it matter?
- What scientific concepts or mathematical tools do we need to understand to solve this?
- How will we know if our design is successful?
- What failure points did we discover during testing, and how can we fix them?
- How effectively did our team collaborate to solve this challenge?
- How does physical evidence tell a story without speaking?
- What makes a fingerprint or lip print unique to only one person?
- How can the shape of a blood drop reveal how a crime happened?
- How do we use math and patterns to crack secret codes?
- How do forensic scientists make sure their personal bias does not affect an investigation?
- Which forensic career path best matches my personal strengths and interests?
- What happens to a legal case if evidence is collected or analyzed incorrectly?
- How do we convince different groups of people to make a purchase at the book fair?
- What makes a promotional poster or announcement memorable and persuasive?
- Why is accuracy critical when scanning inventory and handling money?
- What steps do we take when a transaction or technology doesn't work correctly?
- What does excellent customer service look and sound like in a school setting?
- How do our individual roles contribute to the financial success of the fair?

Summative Assessment and/or Summative Criteria

Assessment is primarily formative classroom observations. Others include anecdotal records, student/teacher conferences, running records, worksheets, and prototypes.

Some summative assessment may be used for identification such as:

Benchmark assessments, LinkIt Assessments, NNAT3, Williams CAP

Resources

Power Point Presentations
Resource Folder Worksheets (planning guides, challenge tasks)
https://discovere.org/engineering-activities/puff-mobiles/
Catapult https://www.youtube.com/watch?v=-qLlo4AmAsc
https://www.generationgenius.com/videolessons/simple-machines-video-for-kids
https://www.schoolspecialty.com/teachergeek-mousetrap-vehicle-pack-of-10-2004041
https://google.discoveryeducation.com/learn/videos/594e0cf5-6ff7-4f8b-af51-1ec58c5eecac
https://www.google.com/search?q=crime+scene+sketching+photo
https://sciencetrek.org/topics/csi/resources
https://www.sciencespot.net/Pages/classforsci.html#gsc.tab=0

Unit Plan

Topic/Selection Time Frame	General Objectives	Instructional Activities	Standards
Topic: TAG Class Introduction Time Frame: 1 week	SWBAT list responsibilities of a TAG student and class expectations SWBAT demonstrate their ability to follow directions and creativity by participating in the game, "The Quest" and digital and physical classroom escape rooms.	Discussion of responsibilities and expectations for class. Students will participate in two icebreaker activities. Students will organize into groups of 5 to participate in "The Quest." Each group will work together to solve various types of problems as quickly as possible testing their collaboration, creativity, and critical thinking skills. Students will organize into groups of 3-4 to solve digital and physical classroom escape rooms with tasks focused on creativity and critical thinking skills.	GIFT.PK-12.2.1.1 GIFT.PK-12.3.4.2 GIFT.PK-12.4.1.3 GIFT.PK-12.1.1.3 GIFT.PK-12.1.3.1
Topic: The Engineering Design Process Timeframe: 2 weeks	SWBAT explain and demonstrate the engineering design process. SWBAT apply scientific principles to solve design problems. SWBAT evaluate competing designs for successes and failures and provide feedback.	The Puff Mobile Challenge Review of the Engineering Design Process. Explain how wind, force, and friction play a role in how a car moves. Students will work in teams of 2 to 3 with a planning guide to design a wind-powered car using only five simple household materials. The goal is to build a vehicle that travels the farthest distance using a limited number of air puffs	SCI.MS.ETS1.A SCI.MS-ETS1-1 SCI.MS-ETS1-2 SCI.MS-ETS1-4 **9.4.8.CI.2** **9.4.8.CI.3** **9.4.8.CT.2**

		typically 1–3. Followed by an evaluation of designs for successes and failures and how wind, force, and friction affected the design.	
Topic: The Engineering Design Process Timeframe: 3 weeks	SWBAT explain and demonstrate the engineering design process. SWBAT apply scientific principles to solve design problems. SWBAT evaluate competing designs for successes and failures and provide feedback.	The Catapult Challenge Describe how force and angles affect the motion of a projectile when using a catapult. Students will initially work alone and use a "Launcher Kit" to build a simple machine launcher that projects an object. After evaluation, students may choose to work with another student to redesign their catapult to create a catapult that launches an object the farthest distance. Students will test their designs, and a winner will be announced. They will compare designs for best ideas, describe how force and angle affected their design, and provide feedback.	SCI.MS.ETS1.A SCI.MS-ETS1-2 SCI.MS-ETS1-4 **9.4.8.CI.2** **9.4.8.CI.3** **9.4.8.CT.2**
Topic: The Engineering Design Process Timeframe: 3 weeks	SWBAT explain and demonstrate the engineering design process. SWBAT apply scientific principles to solve design problems. SWBAT analyze data from initial designs to identify performance failures and redesign prototype for success.	Mouse Trap Car Challenge Explain potential vs. kinetic energy as it applies to a mousetrap and car. Students will individually follow instructions to build a functioning mouse trap vehicle. Then using additional materials,	SCI.MS.ETS1.A SCI.MS-ETS1-3 SCI.MS-ETS1-4 **9.4.8.CI.2** **9.4.8.CI.3** **9.4.8.CT.2**

		students will be challenged to modify two variables to increase distance or speed to see which car can go the furthest and the fastest. Students will collect and analyze data to improve their design. A winner will be announced for both distance and speed.	
Topic: The Engineering Design Process Real World Timeframe: 2 weeks	SWBAT design, build, test, and improve a solar oven that uses renewable energy to heat food or water, while collecting and analyzing temperature data to determine the effectiveness of their design.	Ask students how can engineers harness the sun's energy to solve everyday problems? Discuss renewable energy and how solar energy can be used for cooking and heating. Students will work in groups of 2-3 to sketch a solar oven design and identify how it will absorb heat, reflect sunlight, and trap heat inside. Then students construct their ovens using the provided materials. Ovens will be placed in direct sunlight and measure the temperature every 5 minutes. Students will record starting temperature, highest temperature reached, and time needed to melt a marshmallow or heat water. Students will create a graph of temperature changes over time and	SCI.MS.ETS1.A SCI.MS-ETS1-3 SCI.MS-ETS1-4 **9.4.8.CI.2** **9.4.8.CI.3** **9.4.8.CT.2**

		compare results with other groups. Students will identify weaknesses and redesign their oven for greater efficiency and present to the class.	
Topic: Forensics Timeframe: 2 weeks	SWBAT define forensic science and explain its role in solving real-world criminal investigations. SWBAT differentiate between direct evidence and circumstantial evidence. SWBAT analyze a basic crime scene setup, record observations accurately, and draw evidence-based inferences.	Introduction to Forensic Science & Evidence Analysis Display a single, intriguing photograph and ask students to study it for 60 seconds. Ask students to write down three observations/facts and two inferences/interpretations. Then discuss why forensic investigators must separate objective facts from assumptions. Introduce the definition of forensic science, Locard's Exchange Principle, direct evidence and circumstantial evidence. Students will work in groups of 3-4, to crime scene map a mock crime scene in the back of the room. They will complete a Crime Scene report sheet with a sketch of the scene and list at least 5 pieces of physical evidence. Then make 3 inferences.	GIFT.PK-12.4.1.1 GIFT.PK-12.5.1.2
Topic: Forensics Timeframe: 1 week	SWBAT categorize friction ridge patterns	Anatomy of Fingerprints & Classification	GIFT.PK-12.4.1.1

	into the three primary groups: Loops, Whorls, and Arches. SWBAT identify fingerprints to determine if two prints match.	Explain the basic pattern frequencies (Loops ~65%, Whorls ~30%, Arches ~5%) and show visual examples of sub-types (e.g., tented arch, double loop) using a Power Point presentation. Students will take their own fingerprints on a card and using a magnifying glass identify the pattern for each finger. Distribute Who Done It? folders and have students analyze and identify which fingerprints match those found at the crime scene.	GIFT.PK-12.5.1.2
Topic: Forensics Timeframe: 1 week	SWBAT differentiate between patent, plastic, and latent fingerprints. SWBAT perform a lift a of clear, usable latent fingerprint from a non-porous surface using dusting powder and tape.	Latent Print Lifting: Dusting Techniques Discuss how natural oils leave invisible prints behind. Compare and contrast patent, plastic, and latent fingerprints. Demonstrate how to gently lift a fingerprint from a glass surface and transfer it to an index card. After using hand lotion, students will press their fingers onto clear plastic cups and follow the procedures for lifting and transferring the prints. Students will analyze the prints and grade them on	GIFT.PK-12.4.1.1 GIFT.PK-12.5.1.2

		a quality score (1–5) based on visibility.	
Topic: Forensics Timeframe: 1 week	SWBAT explain how tooth alignment, gaps, and wear patterns create unique dental profiles. SWBAT analyze and compare a mock bite mark impression to suspect dental casts or overlays.	Forensic Odontology: Bite Mark Analysis Briefly introduce forensic odontology and its role in identifying unknown remains or matching bite marks on perishable evidence. Discuss the characteristics of teeth and how each makes unique impressions. Students will participate in the Bite Analysis activity by gently biting down on a folded piece of Styrofoam plate to make a top and bottom tooth impression and tracing their tooth outlines onto a clear plastic sheet using a fine-point permanent marker. The teacher mixes up the foam plates, and students then rotate through the impressions on foam to match a mystery bite mark back to its owner.	GIFT.PK-12.4.1.1 GIFT.PK-12.5.1.2
Topic: Forensics Timeframe: 1 week	SWBAT define cheiloscopy and identify the primary groove patterns of human lips. SWBAT classify a lip print to compare against known exemplars.	Cheiloscopy: Lip Print Analysis Introduce cheiloscopy and present the 5 basic groove classifications using a Power Point presentation. Students will apply clear lip balm and press their lips against a folded index	GIFT.PK-12.4.1.1 GIFT.PK-12.5.1.2

		card or paper envelope. Using magnifying glasses, they will analyze the middle section of their lower lip print and classify the groove pattern. Students will work in pairs to participate in the Secret Envelope activity where they attempt to identify a "mystery sender" from a set of anonymized class exemplars.	
Topic: Forensics Timeframe: 1 week	SWBAT identify key handwriting characteristics (e.g., slant, letter spacing, line quality, dotting of 'i's and crossing of 't's). SWBAT analyze a simulated ransom note to determine if it matches a suspect's writing sample.	Handwriting Analysis & Fraud Have students try to copy a partner's signature three times on a scrap paper. Discuss how difficult it is to alter automatic motor habits. Discuss primary handwriting traits analyzed by document examiners: letter spacing, pressure, slant, baseline alignment, connecting strokes, and pen lifts. Students will work in pairs to solve the Ransom Note crime. Students will be given a copy of the ransom note and then use a trait checklist matrix to score each suspect based on specific traits to determine the author.	GIFT.PK-12.4.1.1 GIFT.PK-12.5.1.2

Topic: Forensics Timeframe: 1 week	SWBAT identify the 6 categories of blood stain patterns. SWBAT predict and analyze the results of blood patterns when blood is dropped from different heights. SWBAT To predict and analyze the results of the effects of a surface type on blood splatter patterns.	Blood Spatter Analysis Demonstrate each category of blood stain pattern created by John Glaister using a dropper, synthetic blood, and paper. Students will work in groups of 2-3 and use synthetic blood to test the effect height and surface type have on blood spatter. They will record and report their findings.	GIFT.PK-12.4.1.1 GIFT.PK-12.5.1.2
Topic: Forensics Timeframe: 1 week	SWBAT differentiate between plaintext, ciphertext, and encryption keys. SWBAT encrypt and decrypt messages using historical substitution ciphers.	Cryptography & Coded Evidence Present a simple scrambled sentence "MEET ME AT NOON" shifted by 1 letter: "NFFU NF BU OPPO". Introduce cryptography basics. Explain the Caesar Cipher (shifting alphabet by a set key number) and the Pigpen Cipher (using a grid system to replace letters with geometric symbols.) Students will work in pairs to break the suspect's encrypted journal using Caesar wheels and grid keys to decode the messages.	GIFT.PK-12.4.1.1 GIFT.PK-12.5.1.2
Topic: Forensics Timeframe: 2 weeks	SWBAT compare and contrast careers within the study of forensic science.	Careers in Forensic Science Students will watch the Discovery video, Life Science: Forensics and	GIFT.PK-12.5.1.2 **9.2.8.CAP.2**

		list all the jobs seen in the video to solve the crime of John Glenn. Introduce and discuss careers in forensics, and have the students use a t-chart to identify which careers they would choose and why or why not.	
Topic: Forensics Timeframe: 4 weeks	SWBAT select and apply key forensic principles to evaluate a real-world crime or construct an original mystery narrative. SWBAT synthesize research or original plot elements into a clear, structured final product (presentation or creative story/portfolio). SWBAT present their forensic findings or story elements using precise scientific terminology and evidence-based reasoning.	Forensics Capstone: Famous Case Analysis or Mastermind Mystery Writer Review key concepts learned throughout the unit and explain students will demonstrate their mastery through a choice project. Students will have two options for a final project. Option A is to research and create a presentation on a famous real-world criminal case and analyze how forensic science was used or misused. Option B is to work alone or in pairs to write an original short crime mystery incorporating at least three specific forensic science techniques learned in class. Students will present their final projects.	GIFT.PK-12.3.4.2 GIFT.PK-12.4.1.1 **9.4.8.IML.3**
Topic: Forensics Timeframe: 2 weeks	SWBAT evaluate textual evidence within a short mystery narrative to distinguish between facts, clues, and red herrings.	Sleuthing with Syntax: Critical Thinking & Mystery Solving Introduce deductive reasoning, drawing a specific conclusion based	GIFT.PK-12.3.4.2 GIFT.PK-12.4.1.1

	SWBAT apply deductive reasoning to formulate a logical hypothesis identifying the prime suspect or motive.	on general premises or facts and red herring, a misleading clue intended to distract from the real issue. Students will read short detective stories aloud then highlight clues and circle red herrings. In pairs, the students will compare ideas, collaborate to solve the mystery, and report their findings.	
Topic: Marketing the Scholastic Book Fair Time Frame: 3 weeks	SWBAT explain and define various marketing terms and how they relate to the business world. SWBAT develop & execute promotional strategies for the Middle School Book Fair. SWBAT to	The Scholastic Book Fair Students will define the term marketing. Marketing is the process of planning and executing the pricing, promotion and distribution of ideas, goods, and services to create exchanges between buyers and sellers. Review the 4 P's in marketing (product, price, place & promotion.) Students will brainstorm theme ideas and then choose one to apply to the book fair. Students will brainstorm ways to promote the book fair and construct materials to market such as announcements, raffle materials, signage, and decorations.	GIFT.PK-12.3.4.2 GIFT.PK-12.5.1.5 GIFT.PK-12.5.1.2 **9.4.8.IML.3**
Topic: Running the Scholastic Book Fair Timeframe: 1 week	SWBAT explain the parts of a scanning cash register.	Running the Scholastic Book Fair Introduce the scanning cash register.	GIFT.PK-12.3.4.2 GIFT.PK-12.5.1.5 GIFT.PK-12.5.1.2 **9.4.8.IML.3**

	SWBAT demonstrate how to process a cash purchase.	Students will watch the Scholastic video detailing instructions on how to use their scanning cash register. Student will practice using the register and making change.	

Standards

1.1	Self-Understanding. Students with gifts and talents demonstrate self-knowledge with respect to their interests, strengths, identities, and needs in socio-emotional developm and in intellectual, academic, creative, leadership, and artistic domains.
1.3.1	Educators provide a variety of research-based grouping practices for students with gift and talents that allow them to interact with individuals of various gifts, talents, abilities and strengths.
2.1.1	Educators develop environments and instructional activities that encourage students t express diverse characteristics and behaviors that are associated with giftedness.
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensu a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
3.4.2	Educators use creative-thinking strategies to meet the needs of students with gifts and talents.
MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
MS-ETS1-4	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
4.1.1	Educators maintain high expectations for all students with gifts and talents as evidence meaningful and challenging activities.
4.1.3	Educators create environments that support trust among diverse learners.
5.1.2	Educators regularly use enrichment options to extend and deepen learning opportuniti within and outside of the school setting.
5.1.5	Educators regularly use current technologies, including online learning options and assistive technologies to enhance access to high-level programming.

Suggested Modifications for Special Education, ELL and Gifted Students

All students who demonstrate characteristics of giftedness will have access to a variety of enrichment opportunities and resources designed to support advanced learning. To ensure equitable access, enrichment experiences include multiple entry points, such as nonverbal and hands-on activities, that are particularly supportive of twice-exceptional learners and English language learners. Gifted students are

encouraged to self-select learning experiences that align with their strengths, interests, and talents, allowing them to explore areas of passion, deepen their understanding, and develop their abilities at an appropriate pace.

Suggested Technological Innovations/Use

Discovery Education, Codeacademy.com, Python.org, Gamestar Mechanic, MIT App Inventor

Cross Curricular/Career Readiness, Life Literacies and Key Skills Practice

Lessons encourage 21st century skills including: collaboration, communication, creativity, critical thinking, and character. These soft skills promote career readiness and are requisites for success in all curricular areas.

9.4.8.CI.2	Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
9.2.8.CAP.2	Develop a plan that includes information about career areas of interest.
9.4.8.CI.3	Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2).
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
9.4.8.IML.3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).