2024-2025 Gifted & Talented Grade 4 Unit 3: STEM

Content Area: **Gifted and Talented**
Course(s):
Time Period: **Full Year**
Length: **8 Weeks**
Status: **Published**

4th Science - STEM

Unit Rationale

This unit allows students to grow and utilize their STEM skills. STEM teaches critical thinking and innovation. This hands-on and collaborative unit focuses on logical thinking and problem-solving. This helps students develop habits that will allow them to succeed in any field. The design process in STEM, or the engineering design process, is a structured framework that helps people solve problems using science, technology, engineering, and math (STEM) knowledge. STEM projects challenge students to be creative and develop their own solutions. STEM promotes critical thinking, curiosity, persistence, decision-making, leadership, entrepreneurship, and acceptance of failure.

21st Century Life and Career, G&T Standards

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP1.1	Career-ready individuals 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.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP3.1	Career-ready individuals understand the relationship between personal health, workplace performance and personal well-being; they act on that understanding to regularly practice healthy diet, exercise and mental health activities. Career-ready individuals also 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.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace

	with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP6.1	Career-ready individuals 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.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP8.1	Career-ready individuals 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.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP11.1	Career-ready individuals 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.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.
CRP.K-12.CRP12.1	Career-ready individuals 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.
GIFT.PK-12.1.1	Self-Understanding. Students with gifts and talents demonstrate self-knowledge with respect to their interests, strengths, identities, and needs in socio-emotional development and in intellectual, academic, creative, leadership, and artistic domains.
GIFT.PK-12.1.1.1	Educators engage students with gifts and talents in identifying interests, strengths, and gifts.
GIFT.PK-12.1.1.2	Educators assist students with gifts and talents in developing identities supportive of achievement.
GIFT.PK-12.1.2	Self-Understanding. Students with gifts and talents possess a developmentally appropriate understanding of how they learn and grow; they recognize the influences of their beliefs, traditions, and values on their learning and behavior.
GIFT.PK-12.1.2.1	Educators develop activities that match each student's developmental level and culture-based learning needs.
GIFT.PK-12.1.3	Self-Understanding. Students with gifts and talents demonstrate understanding of and respect for similarities and differences between themselves and their peer group and others in the general population.
GIFT.PK-12.1.3.1	Educators provide a variety of research-based grouping practices for students with gifts and talents that allow them to interact with individuals of various gifts, talents, abilities, and strengths.

GIFT.PK-12.1.3.2	Educators model respect for individuals with diverse abilities, strengths, and goals.
GIFT.PK-12.1.4	Awareness of Needs. Students with gifts and talents access resources from the community to support cognitive and affective needs, including social interactions with others having similar interests and abilities or experiences, including same-age peers and mentors or experts.
GIFT.PK-12.1.5.1	Educators collaborate with families in accessing resources to develop their child's talents.
GIFT.PK-12.1.6	Cognitive and Affective Growth. Students with gifts and talents benefit from meaningful and challenging learning activities addressing their unique characteristics and needs.
GIFT.PK-12.1.6.1	Educators design interventions for students to develop cognitive and affective growth that is based on research of effective practices.
GIFT.PK-12.1.6.2	Educators develop specialized intervention services for students with gifts and talents who are underachieving and are now learning and developing their talents.
GIFT.PK-12.1.7	Cognitive and Affective Growth. Students with gifts and talents recognize their preferred approaches to learning and expand their repertoire.
GIFT.PK-12.1.7.1	Teachers enable students to identify their preferred approaches to learning, accommodate these preferences, and expand them.
GIFT.PK-12.1.8	Cognitive and Affective Growth. Students with gifts and talents identify future career goals that match their talents and abilities and resources needed to meet those goals (e.g., higher education opportunities, mentors, financial support).
GIFT.PK-12.2.1	Identification. All students in grades PK-12 have equal access to a comprehensive assessment system that allows them to demonstrate diverse characteristics and behaviors that are associated with giftedness.
GIFT.PK-12.2.1.1	Educators develop environments and instructional activities that encourage students to express diverse characteristics and behaviors that are associated with giftedness.
GIFT.PK-12.2.1.2	Educators provide parents/guardians with information regarding diverse characteristics and behaviors that are associated with giftedness.
GIFT.PK-12.2.2	Identification. Each student reveals his or her exceptionalities or potential through assessment evidence so that appropriate instructional accommodations and modifications can be provided.
GIFT.PK-12.2.2.1	Educators establish comprehensive, cohesive, and ongoing procedures for identifying and serving students with gifts and talents. These provisions include informed consent, committee review, student retention, student reassessment, student exiting, and appeals procedures for both entry and exit from gifted program services.
GIFT.PK-12.2.2.2	Educators select and use multiple assessments that measure diverse abilities, talents, and strengths that are based on current theories, models, and research.
GIFT.PK-12.2.2.3	Assessments provide qualitative and quantitative information from a variety of sources, including off-level testing, are nonbiased and equitable, and are technically adequate for the purpose.
GIFT.PK-12.2.2.4	Educators have knowledge of student exceptionalities and collect assessment data while adjusting curriculum and instruction to learn about each student's developmental level and aptitude for learning.
GIFT.PK-12.2.2.5	Educators interpret multiple assessments in different domains and understand the uses and limitations of the assessments in identifying the needs of students with gifts and talents.
GIFT.PK-12.2.2.6	Educators inform all parents/guardians about the identification process. Teachers obtain parental/guardian permission for assessments, use culturally sensitive checklists, and elicit evidence regarding the child's interests and potential outside of the classroom setting.
GIFT.PK-12.2.3	Identification. Students with identified needs represent diverse backgrounds and reflect the total student population of the district.

GIFT.PK-12.2.4	Learning Progress and Outcomes. Students with gifts and talents demonstrate advanced and complex learning as a result of using multiple, appropriate, and ongoing assessments.
GIFT.PK-12.2.5	Evaluation of Programming. Students identified with gifts and talents demonstrate important learning progress as a result of programming and services.
GIFT.PK-12.3.1	Curriculum Planning. Students with gifts and talents demonstrate growth commensurate with aptitude during the school year.
GIFT.PK-12.3.4	Instructional Strategies. Students with gifts and talents become independent investigators.
GIFT.PK-12.3.4.1	Educators use critical-thinking strategies to meet the needs of students with gifts and talents.
GIFT.PK-12.3.4.2	Educators use creative-thinking strategies to meet the needs of students with gifts and talents.
GIFT.PK-12.3.4.3	Educators use problem-solving model strategies to meet the needs of students with gifts and talents.
GIFT.PK-12.3.4.4	Educators use inquiry models to meet the needs of students with gifts and talents.
GIFT.PK-12.3.5	Culturally Relevant Curriculum. Students with gifts and talents develop knowledge and skills for living and being productive in a multicultural, diverse, and global society.
GIFT.PK-12.3.5.1	Educators develop and use challenging, culturally responsive curriculum to engage all students with gifts and talents.
GIFT.PK-12.3.6	Resources. Students with gifts and talents benefit from gifted education programming that provides a variety of high quality resources and materials.
GIFT.PK-12.4.1	Personal Competence. Students with gifts and talents demonstrate growth in personal competence and dispositions for exceptional academic and creative productivity. These include self-awareness, self-advocacy, self-efficacy, confidence, motivation, resilience, independence, curiosity, and risk taking.
GIFT.PK-12.4.1.1	Educators maintain high expectations for all students with gifts and talents as evidenced in meaningful and challenging activities.
GIFT.PK-12.4.2	Social Competence. Students with gifts and talents develop social competence manifested in positive peer relationships and social interactions.
GIFT.PK-12.4.2.1	Educators understand the needs of students with gifts and talents for both solitude and social interaction.
GIFT.PK-12.4.3	Leadership. Students with gifts and talents demonstrate personal and social responsibility and leadership skills.
GIFT.PK-12.4.3.1	Educators establish a safe and welcoming climate for addressing social issues and developing personal responsibility.
GIFT.PK-12.4.4	Cultural Competence. Students with gifts and talents value their own and others' language, heritage, and circumstance. They possess skills in communicating, teaming, and collaborating with diverse individuals and across diverse groups.1 They use positive strategies to address social issues, including discrimination and stereotyping.
GIFT.PK-12.4.4.1	Educators model appreciation for and sensitivity to students' diverse backgrounds and languages.
GIFT.PK-12.5.1	Variety of Programming. Students with gifts and talents participate in a variety of evidence-based programming options that enhance performance in cognitive and affective areas.
	Educators, recognizing the learning and developmental differences of students with gifts and talents, promote ongoing self-understanding, awareness of their needs, and cognitive and affective growth of these students in school, home, and community settings to ensure specific student outcomes.

Essential Questions

Why are STEM skills important?

How does the design process promote innovation?

How are hand on projects and learning beneficial?

What can I do when I am stuck?

How can failure help me to succeed?

Instructional Plan

This unit introduces students to the STEM design process and allows students to apply the method to hands-on projects working collaboratively and independently.

Students will for each challenge:

1. Identify a problem: Consider the need for the project, relevant social and economic conditions, and any constraints or requirements.
2. Research: Gather evidence and access prior knowledge to help solve the problem.
3. Brainstorm solutions: Consider how others have approached the problem and sketch possible plans.
4. Build a model or prototype: A prototype is an operating version of the solution that allows the designer to test how it will work.
5. Test and refine: Test the model or prototype and analyze it with others. Redesign based on feedback and retest as needed.
6. Communicate: Defend your solution based on evidence and work collaboratively with peers to critique and build on their ideas

4th STEM Projects Outline

4th STEM Projects Resources Folder

What is the Design Process?

Student Learning Intentions or We are learning to … (WALT)

We are learning about expectations and rules for G&T class for this unit.

We are learning about the design process.

We are learning about the value of failure.

We are learning about famous scientists/engineers.

Student Success Criteria … "I can statements"

I can follow the expectations for STEM G&T.

I can understand each step of the design process.

I can discuss the failure of failure, connecting it to my life.

I can learn about famous scientists and engineers, taking inspiration and motivation for the upcoming unit.

Instructional Strategies and Activities

1. Review G&T rules and expectations
2. Introduce unit goals and timeline
3. 5-10 minute EASY intro STEM challenge.
4. Introduce the design process. Review and discuss each step.
5. View and discuss a design process video. BrainPop Design Process
6. Discuss grit and failure. Watch video. Crash Course Kids Failure How To Fail
7. Organize (consider partnerships) and reflect for upcoming unit.

Formative Assessments

1) Observation

2) Class discussion

3) Group Work

4) Self Assessment

5) STEM Challenge

Instructional Materials and Resources

Gifted & Talented Website(Linked here)

"Rules & Expectations" Slide to present and displayed in Google Classroom (Linked here)

Gifted & Talented Drive(Linked here)

Reflections and Suggested Modifications

Challenge 1 Part I

Student Learning Intentions or We are learning to … (WALT)

We are learning to use the design process to tackle STEM challenges.

We are learning to work collaboratively and independently.

We are learning to embrace and learn from failure.

Student Success Criteria … "I can statements"

I can identify a problem.
I can research.

I can brainstorm.

I can gather appropriate materials.

I can work independently and collaboratively with a positive attitude, not giving up.

Instructional Strategies and Activities

1. Introduce challenge (Select From Drive)

2. Whole class discussion and brainstorm.

3. Collaboratively or independently begin the design process with some teacher guidance. Teacher will assist students in tracking their progress with the process.

4. Students- Identify a problem: Consider the need for the project, relevant social and economic conditions, and any constraints or requirements.

5. Students- Research: Gather evidence and access prior knowledge to help solve the problem.

6. Students- Brainstorm solutions: Consider how others have approached the problem and sketch possible plans.

7. Gather materials in preparation for next class.

8. Discuss and reflect.

Formative Assessments

1) Observation

2) Class discussion

3) Group Work

4) Self Assessment

5) STEM Challenge

Instructional Materials and Resources

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Reflections and Suggested Modifications

Challenge 1 Part 2

Student Learning Intentions or We are learning to … (WALT)

We are learning to use the design process to tackle STEM challenges.

We are learning to work collaboratively and independently.

We are learning to embrace and learn from failure.

Student Success Criteria … "I can statements"

I can build a prototype.
I can test my prototype.

I can I can improve my design.

I can discuss and share with my class.

I can work independently and collaboratively with a positive attitude, and not giving up.

Instructional Strategies and Activities

1. Introduce the challenge

2. Whole class discussion and brainstorming.

3. Collaboratively or independently begin the design process with some teacher guidance. The teacher will assist students in tracking their progress with the process.

4. Students- Build a model or prototype: A prototype is an operating version of the solution that allows the designer to test how it will work.

5. Students- Test and refine: Test the model or prototype and analyze it with others. Redesign based on feedback and retest as needed.

6. Students- Communicate: Defend your solution based on evidence and work collaboratively with peers to critique and build on their ideas

7. Save the final project. Clean up materials.

8. Discuss and reflect.

Formative Assessments

1) Observation

2) Class discussion

3) Group Work

4) Self Assessment

5) STEM Challenge

Instructional Materials and Resources

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Reflections and Suggested Modifications

Challenge 2 Part 1

Student Learning Intentions or We are learning to … (WALT)

We are learning to use the design process to tackle STEM challenges.

We are learning to work collaboratively and independently.

We are learning to embrace and learn from failure.

Student Success Criteria … "I can statements"

I can identify a problem.
I can research.

I can brainstorm.

I can gather appropriate materials.

I can work independently and collaboratively with a positive attitude, not giving up.

Instructional Strategies and Activities

1. Introduce challenge (Select From Drive)

2. Whole class discussion and brainstorm.

3. Collaboratively or independently begin the design process with some teacher guidance. Teacher will assist students in tracking their progress with the process.

4. Students- Identify a problem: Consider the need for the project, relevant social and economic conditions, and any constraints or requirements.

5. Students- Research: Gather evidence and access prior knowledge to help solve the problem.

6. Students- Brainstorm solutions: Consider how others have approached the problem and sketch possible plans.

7. Gather materials in preparation for next class.

8. Discuss and reflect.

Formative Assessments

1) Observation

2) Class discussion

3) Group Work

4) Self Assessment

5) STEM Challenge

Instructional Materials and Resources

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Reflections and Suggested Modifications

Challenge 2 Part 2

Student Learning Intentions or We are learning to … (WALT)

We are learning to use the design process to tackle STEM challenges.

We are learning to work collaboratively and independently.

We are learning to embrace and learn from failure.

Student Success Criteria … "I can statements"

I can build a prototype.
I can test my prototype.

I can I can improve my design.

I can discuss and share with my class.

I can work independently and collaboratively with a positive attitude, and not giving up.

Instructional Strategies and Activities

1. Introduce the challenge

2. Whole class discussion and brainstorming.

3. Collaboratively or independently begin the design process with some teacher guidance. The teacher will assist students in tracking their progress with the process.

4. Students- Build a model or prototype: A prototype is an operating version of the solution that allows the designer to test how it will work.

5. Students- Test and refine: Test the model or prototype and analyze it with others. Redesign based on feedback and retest as needed.

6. Students- Communicate: Defend your solution based on evidence and work collaboratively with peers to critique and build on their ideas

7. Save the final project. Clean up materials.

8. Discuss and reflect.

Formative Assessments

1) Observation

2) Class discussion

3) Group Work

4) Self Assessment

5) STEM Challenge

Instructional Materials and Resources

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Reflections and Suggested Modifications

Challenge 3 Part 1

Student Learning Intentions or We are learning to … (WALT)

We are learning to use the design process to tackle STEM challenges.

We are learning to work collaboratively and independently.

We are learning to embrace and learn from failure.

Student Success Criteria … "I can statements"

I can identify a problem.
I can research.

I can brainstorm.

I can gather appropriate materials.

I can work independently and collaboratively with a positive attitude, and not giving up.

Instructional Strategies and Activities

1. Introduce the challenge (Select From Drive)

2. Whole class discussion and brainstorming.

3. Collaboratively or independently begin the design process with some teacher guidance. The teacher will assist students in tracking their progress with the process.

4. Students- Identify a problem: Consider the need for the project, relevant social and economic conditions, and any constraints or requirements.

5. Students- Research: Gather evidence and access prior knowledge to help solve the problem.

6. Students- Brainstorm solutions: Consider how others have approached the problem and sketch possible plans.

7. Gather materials in preparation for the next class.

8. Discuss and reflect.

Formative Assessments

1) Observation

2) Class discussion

3) Group Work

4) Self Assessment

5) STEM Challenge

Instructional Materials and Resources

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Reflections and Suggested Modifications

Challenge 3 Part 2

Student Learning Intentions or We are learning to … (WALT)

We are learning to use the design process to tackle STEM challenges.

We are learning to work collaboratively and independently.

We are learning to embrace and learn from failure.

Student Success Criteria … "I can statements"

I can build a prototype.
I can test my prototype.

I can I can improve my design.

I can discuss and share with my class.

I can work independently and collaboratively with a positive attitude, and not giving up.

Instructional Strategies and Activities

1. Introduce the challenge

2. Whole class discussion and brainstorming.

3. Collaboratively or independently begin the design process with some teacher guidance. The teacher will assist students in tracking their progress with the process.

4. Students- Identify a problem: Consider the need for the project, relevant social and economic conditions, and any constraints or requirements.

5. Students- Research: Gather evidence and access prior knowledge to help solve the problem.

6. Students- Brainstorm solutions: Consider how others have approached the problem and sketch possible plans.

7. Students- Build a model or prototype: A prototype is an operating version of the solution that allows the designer to test how it will work.

8. Students- Test and refine: Test the model or prototype and analyze it with others. Redesign based on feedback and retest as needed.

9. Students- Communicate: Defend your solution based on evidence and work collaboratively with peers to critique and build on their ideas

10. Save the final project. Clean up materials.

11. Discuss and reflect.

Formative Assessments

1) Observation

2) Class discussion

3) Group Work

4) Self Assessment

5) STEM Challenge

Instructional Materials and Resources

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Reflections and Suggested Modifications

Challenge 4

Student Learning Intentions or We are learning to … (WALT)

We are learning to use the design process to tackle STEM challenges.

We are learning to work collaboratively and independently.

We are learning to embrace and learn from failure.

Student Success Criteria … "I can statements"

I can identify a problem.
I can research.

I can brainstorm.

I can gather appropriate materials.

I can build a prototype.
I can test my prototype.

I can I can improve my design.

I can discuss and share with my class.

I can work independently and collaboratively with a positive attitude, and not giving up.

Instructional Strategies and Activities

1. Introduce the challenge. This should be a shorter, one day challenge. (Select From Drive)

2. Whole class discussion and brainstorming.

3. Collaboratively or independently begin the design process with some teacher guidance. The teacher will assist students in tracking their progress with the process.

4. Students- Build a model or prototype: A prototype is an operating version of the solution that allows the designer to test how it will work.

5. Students- Test and refine: Test the model or prototype and analyze it with others. Redesign based on feedback and retest as needed.

6. Students- Communicate: Defend your solution based on evidence and work collaboratively with peers to critique and build on their ideas

7. Save the final project. Clean up materials.

8. Discuss and reflect.

Formative Assessments

1) Observation

2) Class discussion

3) Group Work

4) Self Assessment

5) STEM Challenge

Instructional Materials and Resources

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Reflections and Suggested Modifications

Presentation To Class

Student Learning Intentions or We are learning to … (WALT)

We are learning to share our design process knowledge to the class.

We are learning to present our greatest successes and/or failures to our class.

We are learning to accept and respectfully answer the questions of our classmates.

Student Success Criteria … "I can statements"

I can explain the design process using a chart.

I can share one of my projects with the class, explaining my process.

I can answer my classmates' questions.

Instructional Strategies and Activities

1. Explain and model presentation expectations.
2. Students will present the design process to their class.
3. Each student will share and discuss a project.
4. Each student will respond to a Q&A.
5. Post-presentation reflection.

Formative Assessments

1) Observation

2) Class discussion

3) Group Work

4) Self Assessment

5) Presentation

Instructional Materials and Resources

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Reflections and Suggested Modifications

Pre-Assessments

4th Third Marking Period: Science G&T Requirements

- Teacher Recommendation
- Earn an A in science during the 1st and 2nd trimester report cards.

Science Pre-Assessment Folder

Integration of Diversity, Equity and Inclusion; Climate Change; Informational and Media Literacy

See Crosswalks

BrainPop George Washington Carver

BrainPop Madam CJ Walker

BrainPopAliceBall

BrainPop Jane Goodall

BrainPop Marie Curie

Modifications and/or Accommodations

Suggested Modifications (ELL, Sp. Ed, GIfted, At-risk of Failure)

English Language Learners

Native language support: The teacher provides auditory or written content to students in their native language.

Adjusted Speech: The teacher changes speech patterns to increase student comprehension. This could include facing the students, paraphrasing, clearly indicating the most important ideas, and speaking more slowly.

Visuals: The teacher uses graphics, pictures, visuals, and manipulatives. This helps ELL students better understand and comprehend the subjects at hand.

Front-Loading Vocabulary: The teacher front loads vocabulary. This means providing students with a list of important vocabulary words they will need to know for a book, lesson, etc. prior to the lesson being taught. Including pictures to go with the vocabulary words is also very beneficial for the students.

Special Education Students

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily

overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Oral Reading: The teacher will read work orally to students. Class work such as tests and literature circles may need to be read aloud to the student.

Timers: The teacher will use timers as an instructional tool. The use of timers is beneficial for students who have trouble completing tasks. Timers can be helpful so the student is aware of how much time they have to complete an assignment.

Students with 504 Plans

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Gifted & Talented Strategies

Extensions/Enrichments: Teachers will provide gifted and talented students with extension/enrichment projects. Students will be challenged to further their understanding, to apply acquired knowledge, and/or to produce something in reference to acquired knowledge.

Modify/Change Activities: Teachers will monitor and modify activities to accommodate those students who need to be challenged further. Additional reading, problem-solving, writing, or project work is necessary for those students who are ready to move on at a rate more accelerated than their peers. In this way, G & T students are provided the same opportunity for support as special needs students.

Students at Risk of School Failure

Directions or Instructions: Make sure directions and/or instructions are given in limited numbers. Give directions/instructions verbally and in simple written format. Ask students to repeat the instructions or directions to ensure understanding occurs. Check back with the student to ensure he/she hasn't forgotten.

Peer Support: Peers can help build confidence in other students by assisting in peer learning. Many teachers use the 'ask 3 before me' approach. This is fine, however, a student at risk may have to have a specific student or two to ask. Set this up for the student so he/she knows who to ask for clarification before going to you.

Alternate or Modified Assignments: Always ask yourself, "How can I modify this assignment to ensure the students at risk are able to complete it?" Sometimes you'll simplify the task, reduce the length of the assignment or allow for a different mode of delivery. For instance, many students may hand something in, the at-risk student may jot notes and give you the information verbally. Or, it just may be that you will need to assign an alternate assignment.

Increase One to One Time: When other students are working, always touch base with your students at risk and find out if they're on track or needing some additional support. A few minutes here and there will go a long way to intervene as the need presents itself.

Contracts: It helps to have a working contract between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of using contracts is to eventually have the student come to you for completion sign-offs.

Hands On: As much as possible, think in concrete terms and provide hands-on tasks. This means a child doing math may require a calculator or counters. The child may need to tape record comprehension activities instead of writing them. A child may have to listen to a story being read instead of reading it him/herself.

Tests/Assessments: Tests can be done orally if need be. Break tests down in smaller increments by having a portion of the test in the morning, another portion after lunch and the final part the next day.

Seating: Seat students near a helping peer or with quick access to the teacher. Those with hearing or sight issues need to be close to the instruction which often means near the front.

New Jersey Student Learning Standards: Content Area

SCI.3-5-ETS1	Engineering Design
SCI.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.
	Asking Questions and Defining Problems
	Asking questions and defining problems in 3–5 builds on K–2 experiences and progresses

	to specifying qualitative relationships.
	Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.
SCI.3-5.ETS1.A	Defining and Delimiting Engineering Problems
	Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.
	Influence of Engineering, Technology, and Science on Society and the Natural World
	People's needs and wants change over time, as do their demands for new and improved technologies.
SCI.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.
	Constructing Explanations and Designing Solutions
	Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
	Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.
SCI.3-5.ETS1.B	Developing Possible Solutions
	Research on a problem, such as climate change, should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions.
	At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.
	Influence of Engineering, Technology, and Science on Society and the Natural World
	Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.
SCI.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.
	Planning and Carrying Out Investigations
	Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.
	Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
SCI.3-5.ETS1.B	Developing Possible Solutions
	Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.
SCI.3-5.ETS1.C	Optimizing the Design Solution
	Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.

Integration of Career Readiness, Life Literacies and Key Skills

TECH.9.4.5.CI	Creativity and Innovation
TECH.9.4.5.CI.1	Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).
TECH.9.4.5.CI.2	Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue (e.g., 6.3.5.CivicsPD.3, W.5.7).
TECH.9.4.5.CI.3	Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
TECH.9.4.5.CI.4	Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6).
TECH.9.4.5.CT	Critical Thinking and Problem-solving
TECH.9.4.5.CT.1	Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
TECH.9.4.5.CT.2	Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).
TECH.9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
TECH.9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
TECH.9.4.5.GCA	Global and Cultural Awareness
	Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions.
	Culture and geography can shape an individual's experiences and perspectives.
	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
	Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.
	Collaborating digitally as a team can often develop a better artifact than an individual working alone.

Integration of Computer Science and Design Thinking

CS.3-5.8.1.5.AP.6	Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.
CS.3-5.8.2.5.ED.1	Explain the functions of a system and its subsystems.
CS.3-5.8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
CS.3-5.8.2.5.ED.3	Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
CS.3-5.8.2.5.ED.4	Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).
CS.3-5.8.2.5.ED.5	Describe how specifications and limitations impact the engineering design process.
CS.3-5.8.2.5.ED.6	Evaluate and test alternative solutions to a problem using the constraints and trade-offs

	identified in the design process.
CS.3-5.ED	Engineering Design
	Individuals develop programs using an iterative process involving design, implementation, testing, and review.
	Engineering design requirements include desired features and limitations that need to be considered.
	A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals).
	Different algorithms can achieve the same result. Some algorithms are more appropriate for a specific use than others.
	Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge. Often, several design solutions exist, each better in some way than the others.
	Data can be organized, displayed, and presented to highlight relationships.
	Shared features allow for common troubleshooting strategies that can be effective for many systems.

Interdisciplinary Connections: NJSLS for ELA, Social Studies, Science and/or Math

MATH.K-12.1	Make sense of problems and persevere in solving them
	Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.
MATH.K-12.2	Reason abstractly and quantitatively
	Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.8	Look for and express regularity in repeated reasoning

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$ and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.