Totowa Mathematics Curriculum Project

Aligned to the NJDOE Model Curriculum

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Pacing Guide	
Content Area: STEAM (Science, Technology, Engineering, Art, and Mathematics)	
Course Title: Gifted and Talented	**Grade Level: 3-4**
Unit 1: Viewpoints	**September-November**
Unit 2: Economics/Financial Literacy	**December-February**
Unit 3: Independent Learning Project Student Quest/My Place in the World (Project Based Learning)	**March-April**
Unit 4: Logic	**May-June**

Created for New Jersey school districts through a project of the New Jersey Department of Education, Office of Academic Standards, in partnership with the N.J Association for Supervision and Curriculum Development and the N.J. Principals and Supervisors Association.

Unit 1 Overview		
Content Area: STEAM (Science, Technology, Engineering, Art, and Mathematics)		
Unit Title: Viewpoints		
Target Course/Grade Level: 3-4		
Unit Summary: Students will prepare for and participate in a formal debate. Topics of the debate will be student selected from conflicts in their school, community, or world. In teams, students will research topics, develop statements, and prepare arguments. Teams will formally debate topics to be judged by students not debating. **Interdisciplinary connections:** Including but not limited to reading, writing, technology, science, social studies, engineering, art, and mathematics **21st century themes:** Critical Thinking and Problem Solving; Collaboration, Teamwork, Leadership; Creativity & Innovation; Cross Cultural Understanding & Interpersonal Communication www.nj.gov/education/cccs/standards/9/		
Unit Rationale: Every lesson in G and T STEAM is aligned to Common Core State Standards. Provided below is a listing of Mathematical Practices and Literacy in History/Social Studies, Science and Technology standards addressed in a single lesson and its application to STEAM program.		
Learning Targets		
SLO	**CCSSMP CCSS.RST.6-8.1-10**	**Application**
1 – Make sense of problems and persevere in solving them.	**CCSSMP1**	Engage and Persist by learning to develop focus and other ways of thinking helpful to working and persevering at art tasks. Interpret and communicate STEAM information. Engage in inquiry.
2 – Reason abstractly and quantitatively.	**CCSSMP2**	Stretch and Explore by learning to reach beyond one's supposed limitations; to embrace the opportunity to learn from mistakes and accidents. Engage in logical reasoning.
3 –Construct viable arguments and critique the reasoning of others.	**CCSSMP3**	Reflect by learning to think and talk with others about one's work and the process of making it. Interpret and communicate STEAM information.
4 – Model with mathematics	**CCSSMP4**	Express by learning to create works that convey an idea, feeling or personal meaning. Integrate STEAM content.
5 – Use appropriate tools strategically.	**CCSSMP5**	Develop craft by learning to use tools and materials. Apply technology appropriately.
6 – Attend to precision.	**CCSSMP6**	Observe by learning to attend to visual, audible and written contexts more closely than ordinary "looking" requires. Interpret and communicate STEAM information.
7- Look for and make use of structure.	**CCSSMP7**	Observe by learning to attend to visual, audible

		and written contexts more closely than ordinary "looking" requires. Learn and apply rigorous STEAM content.
8- Look for and express regularity and repeated reasoning.	**CCSSMP8**	Express by learning to create works that convey an idea, feeling or personal meaning. Engage in logical reasoning.

Unit Essential Questions

- What influences a person's viewpoint?
- What are the advantages/disadvantages of having the same or different viewpoints?
- How do debates help us develop and share our viewpoints?

Unit Enduring Understandings

- Viewpoints are rarely stagnant and may change over time.
- Personal viewpoints may be influenced and manipulated by a person's culture, background and outside influences.
- Debates are peaceful means for sharing viewpoints and resolving conflicts.

Unit Learning Targets

Students will be able to...

- Research data to support viewpoints
- Analyze text to identify multiple points of view
- Use Primary and Secondary information sources
- Interpret statistical information
- Analyze poetry to determine viewpoints
- Participate in Literature Circles

Evidence of Learning

Summative Assessment –student research and presentation at the unit halfway point and at the end. Intent is to provide a summary of student's acquired skills and educator reflection of programs.

- Persuasive Essays
- Debates
- Self selected viewpoint presentation (i.e. digital storytelling, voice thread, dramatic play, art, music)

Formative Assessments

- Teacher created assessments using computer research and other curriculum resources listed.
- Pre-assessments – What do you know and what do you want to review from a previous related activity
- Portfolios
- Research
- Graphic Organizers
- Teacher Observation
- Homework
- Class work (worksheet/activity)

Equipment Needed: Folders, computers, internet, pencils, PowerPoint, Microsoft Word

Teacher Resources:

- Seedfolks- Paul Fleischman
- Voices in the Park- Anthony Brone
- Encounter- Jane Yolen
- Sign of the Beaver- Elizabeth George Speare
- Black Beauty- Anna Sewell
- If by Sarah Perry
- Zoom and Rezoom- Istvan Banyai
- George vs. George - Roslyn Schanzer
- http://education.nationalgeographic.com/archive/xpeditions/lessons/06/g35/sameplace.htm

Integration of Technology:

- Smartboard
- Computers
- I-pads
- Internet
- Multi-media Presentations
- Video Streaming

Curriculum Development Resources-including, but not limited to the resources available below. Click the links below to access additional resources used to supplement this unit:

- http://www.corestandards.org
- http://www.mtlaurelschools.org/documents/Curriculum/GAP2014-Kto8.pdf
- www.yahoo.com
- www.google.com

Unit 2 Overview		
Content Area: STEAM (Science, Technology, Engineering, Art, and Mathematics)		
Unit Title: Economics/Financial Literacy		
Target Course/Grade Level: 3-4		
Unit Summary: Students will prepare a diversified investment portfolio. Stocks and mutual funds purchased will be student selected through research. In teams, students will buy and sell stocks and mutual funds through an on-line simulation program. Teams will compete with other groups throughout New Jersey. **Interdisciplinary connections:** Including but not limited to reading, writing, technology, science, social studies, engineering, art, and mathematics. **21st century themes:** Critical Thinking and Problem Solving; Collaboration, Teamwork, Leadership; Creativity & Innovation; Cross Cultural Understanding & Interpersonal Communication www.nj.gov/education/cccs/standards/9/		
Unit Rationale: Every lesson in G and T STEAM is aligned to Common Core State Standards. Provided below is a listing of Mathematical Practices and Literacy in History/Social Studies, Science and Technology standards addressed in a single lesson and its application to STEAM program.		
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2 – Reason abstractly and quantitatively.	**CCSSMP2**	Stretch and Explore by learning to reach beyond one's supposed limitations; to embrace the opportunity to learn from mistakes and accidents. Engage in logical reasoning.
3 –Construct viable arguments and critique the reasoning of others.	**CCSSMP3**	Reflect by learning to think and talk with others about one's work and the process of making it. Interpret and communicate STEAM information.
4 – Model with mathematics	**CCSSMP4**	Express by learning to create works that convey an idea, feeling or personal meaning. Integrate STEAM content.
5 – Use appropriate tools strategically.	**CCSSMP5**	Develop craft by learning to use tools and materials. Apply technology appropriately.
6 – Attend to precision.	**CCSSMP6**	Observe by learning to attend to visual, audible and written contexts more closely than ordinary "looking" requires. Interpret and communicate STEAM information.
7- Look for and make use of structure.	**CCSSMP7**	Observe by learning to attend to visual, audible and written contexts more closely than ordinary

		"looking" requires. Learn and apply rigorous STEAM content.
8- Look for and express regularity and repeated reasoning.	**CCSSMP8**	Express by learning to create works that convey an idea, feeling or personal meaning. Engage in logical reasoning.

Unit Essential Questions	**Unit Enduring Understandings**
• What influences people's decisions about buying and spending? • How are global events interrelated to the global market? • Where and how can a person invest their money? • How are risk and return related with regard to investments?	• Understand how supply and demand influences price and output of products. • Understand how production, distribution and consumption of goods and services are interrelated and are affected by the global market and events in the community. • Leadership, cooperation, and hard work are essential to be economically competitive in today's global economy.

Unit Learning Targets
Students will be able to...

- Participate in the Stock Market Game
- Determine how and why public companies issue stocks.
- Identify stock indexes and how they differ in analyzing stocks traded on the market.
- Identify the effects of global events on stocks and the stock market.
- Analyze potential stocks for purchase and create a diversified stock portfolio.
- Identify sources of financial information and explain their benefits.
- Analyze past, current, and future stock market trends.
- Research and select stocks for investment.
- Identify and differentiate the various types of bonds and mutual funds available to the investor.
- Write effectively for the InvestWrite prompt.
- Create a business that provides a good or service and determine:
  −What will be produced or what service will be provided
  - How it will be produced
  -Who is the target audience
  -How much will be produced
- Select a President, accountant and marketing agent •
- Model day-to-day interactions within the company.
- Determine positive and negative consequences in the company
- Prepare a resume
- Prepare and complete job applications
- Prepare financial statements

Summative Assessment –student research and presentation at the unit halfway point and at the end. Intent is to provide a summary of student's acquired skills and educator reflection of programs.

- InvestWrite essay
- Investment Portfolio

- Self assessment

Formative Assessments

- Teacher created assessments using computer research and other curriculum resources listed.
- Pre-assessments – What do you know and what do you want to review from a previous related activity
- Portfolios
- Research
- Teacher Observation
- Graphic Organizers
- Homework
- Class work (worksheet/activity)

Equipment Needed: Folders, computers, internet, pencils
Teacher Resources:

Digital Resources

Stock Market Resources:
• www.smgww.org
• http://finance.yahoo.com
• http://www.investwrite.org
• http://www.nasdaq.com
• http://www.prongo.com/stock/index.pl
• http://www.youtube.com/watch?v=yIZaelw_cHE

Entrepreneurship Resources:
• http://www.entre-ed.org/_teach/activits.htm
• http://www.teachingkidsbusiness.com/index.htm
• http://ecedweb.unomaha.edu/k-12/k-5concepts.cfm
• http://www.kansascityfed.org/education/foreducators/elem-classroom-resources.cfm

Text Resources:
The Hundred Penny Box - by Sharon Bell Mathis
• Global Economy: America and the World – A True Book – Great American Business
• Starting Your Own Business – A True Book – Great American Business
• The Great Depression – by Elaine Landau
• The Get Rich Quick Club – by Dan Gutman
• Lunch Money – by Andrew Clements

Integration of Technology:

- Smartboard
- Computers
- I-pads
- Internet
- Multi-media Presentations

- Video Streaming
- Calculators
- Software

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- www.google.com
- www.yahoo.com

Unit 3 Overview		
Content Area: STEAM (Science, Technology, Engineering, Art, and Mathematics)		
Unit Title: Independent Learning Project Student Quest/My Place in the World (Project Based Learning)		
Target Course/Grade Level: 3-4		
Unit Summary: Students will answer a higher level thinking question of their own choosing and present their findings in a formal presentation. They will be knowledgeable enough to field questions on their subject and to make real-world connections to their topic. The research process necessary to answer this question should involve the students developing deep background knowledge of and comfort with their subject. **Interdisciplinary connections:** Including but not limited to reading, writing, technology, science, social studies, engineering, art, and mathematics. **21st century themes:** Critical Thinking and Problem Solving; Collaboration, Teamwork, Leadership; Creativity & Innovation; Cross Cultural Understanding & Interpersonal Communication www.nj.gov/education/cccs/standards/9/		
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3 –Construct viable arguments and critique the reasoning of others.	**CCSSMP3**	Reflect by learning to think and talk with others about one's work and the process of making it. Interpret and communicate STEAM information.
4 – Model with mathematics	**CCSSMP4**	Express by learning to create works that convey an idea, feeling or personal meaning. Integrate STEAM content.
5 – Use appropriate tools strategically.	**CCSSMP5**	Develop craft by learning to use tools and materials. Apply technology appropriately.
6 – Attend to precision.	**CCSSMP6**	Observe by learning to attend to visual, audible and written contexts more closely than ordinary "looking" requires. Interpret and communicate STEAM information.

7- Look for and make use of structure.	**CCSSMP7**	Observe by learning to attend to visual, audible and written contexts more closely than ordinary "looking" requires. Learn and apply rigorous STEAM content.
8- Look for and express regularity and repeated reasoning.	**CCSSMP8**	Express by learning to create works that convey an idea, feeling or personal meaning. Engage in logical reasoning.

Unit Essential Questions

- How do my actions impact others in my community?
- How will I be an expert on a topic?
- What is the research process?
- What are varied and quality sources I can use to gather information?
- How will I best share what I've learned to make a difference to my community?

Unit Enduring Understandings

- All people can have an impact in the world; whether this impact is positive or negative is a choice they make.
- Projects require efficient planning and communication skills.
- The research process requires inquiry about topics of interest.
- Research is guided by research ethics.
- Product development requires creativity and extensive planning.
- Research should involve using higher level thinking skills

Unit Learning Targets

Students will be able to...

- Engage in a meaningful service experience as an extension of their learning. • Reflect upon the project and process. • Publicly share what they have learned, celebrate the results of the project, and look ahead to the future. • Use important scientific concepts and information in an integrated fashion • Be able to demonstrate the rights and responsibilities of citizenship and principles of democratic civic involvement • Inquire about topics of interest in a way that allows for extensive development of sophisticated research skills.

Evidence of Learning

Summative Assessment –student research and presentation at the unit halfway point and at the end. Intent is to provide a summary of student's acquired skills and educator reflection of programs.

- Google research and other search engine research to complete lesson of choice.
- Presentations.
- Ability to field questions about the topic

Formative Assessments

- Teacher created assessments using computer research and other curriculum resources listed.
- Pre-assessments – What do you know and what do you want to review from a previous related activity
- Rubrics
- Anecdotal Records
- Observation
- Oral Discussions

- Portfolios

Equipment Needed: Folders, computers, internet, pencils, Microsoft Word, PowerPoint

Integration of Technology:

- Smartboard
- Computers
- I-pads
- Internet
- Multi-media Presentations
- Video Streaming
- Calculators
- Software

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- www.yahoo.com

Unit 4 Overview		
Content Area: STEAM (Science, Technology, Engineering, Art, and Mathematics)		
Unit Title: Logic		
Target Course/Grade Level: 3-4		
Unit Summary: Students will choose from a menu of possible tasks: creating a logic matrix, writing an "analogy" book, creating products to be used by classmates in their classrooms and/or a modified coding project. **Interdisciplinary connections:** Including but not limited to reading, writing, technology, science, social studies, engineering, art, and mathematics. **21st century themes:** Critical Thinking and Problem Solving; Collaboration, Teamwork, Leadership; Creativity & Innovation; Cross Cultural Understanding & Interpersonal Communication www.nj.gov/education/cccs/standards/9/		
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		STEAM content.
8- Look for and express regularity and repeated reasoning.	**CCSSMP8**	Express by learning to create works that convey an idea, feeling or personal meaning. Engage in logical reasoning.

Unit Essential Questions	**Unit Enduring Understandings**
• How do we apply higher level thinking skills to help us solve problems? • What higher-level thinking skills are needed to promote creativity?	• Higher-level thinking skills are needed in our rapidly developing world.

Unit Learning Targets
Students will be able to...
Learning targets may include but are not limited to:

- Brainstorm prior knowledge
- Read mystery stories
- Use clues to solve the mysteries
- Create their own mystery creature & share with class.
- Use prior knowledge of "All" statements & "No" statements

Evidence of Learning

Summative Assessment –student research and presentation at the unit halfway point and at the end. Intent is to provide a summary of student's acquired skills and educator reflection of programs.

- Google research and other search engine research to complete lesson of choice.
- Presentation
- Completed project
- Teacher generated assessments using curriculum development resources and other advanced level materials.

Formative Assessments

- Teacher created assessments using computer research and other curriculum resources listed.
- Pre-assessments – What do you know and what do you want to review from a previous related activity
- Rubric
- Journals
- Surveys
- Observation
- Checklists

Equipment Needed: Folders, computers, internet, pencils, PowerPoint, Vimeo

Teacher Resources:

- What Would You Do? Book A-1, Michael O. Baker
- Get Organized Without Losing It, Janet S. Fox

- How to Do Homework Throwing Up, Trevor Romain & Elizabeth Verdick
- True or False? Tests Stink!, Trevor Romain & Elizabeth Verdick
- Stress Can Really Get on Your Nerves!, Trevor Romain & Elizabeth Verdick
- Cliques, Phonies, & Other Baloney, Trevor Romain & Elizabeth Verdick
- Bullies Are a Pain in the Brain, Trevor Romain & Elizabeth Verdick
- How to Take the Grrrr Out of Anger, Trevor Romain & Elizabeth Verdick
- The Essential 55, Ron Clark
- On the Social & Emotional Lives of Gifted Children, Tracey L. Cross, Ph.D
- When Gifted Kids Don't Have All the Answers, Jim Delisle, Ph.D., & Judy
- Galbraith, M.A. • The Gifted Kids Survival Guide For Ages 10 & Under, Judy Galbraith
- The Gifted Kids Survival Guide For Ages 11 & Up, Judy Galbraith
- Responsive Classroom http://www.responsiveclassroom.com
- Howard Gardner: http://www.howardgardner.com/
- Bloom's Revised Taxonomy: http://coe.sdsu.edu/eet/articles/bloomrev/
- The Ungame, All Ages Version, Rhea Zakich, Talicor
- Building Strong Writers in Middle School Deb Delisle and Jim Delisle

Integration of Technology:

- Smartboard
- Computers
- I-pads
- Internet
- Multi-media Presentations
- Video Streaming
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- www.yahoo.com

ELL Strategies

- Provide explicit, systematic instruction in vocabulary.
- Ensure that ELLs have ample opportunities to talk with both adults and peers and provide ongoing feedback and encouragement.
- Expose ELLs to rich language input.
- Scaffolding for ELLs language learning.
- Encourage continued L1 language development.
- Alphabet knowledge
- Phonological awareness
- Print awareness
- Design instruction that focuses on all of the foundational literacy skills.
- Recognize that many literacy skills can transfer across languages.
- English literacy development by helping ELLs make the connection between what they know in their first language and what they need to know in English.
  - Graphic organizers
  - Modified texts
  - Modified assessments
  - Written/audio instruction
  - Shorter paragraph/essay length
  - Homogeneously grouped by level

MODIFICATIONS
Based on Students' Individual Needs

(Special Education Students, English Language Learners, Students at-Risk)

Time/General	**Processing**	**Comprehension**
• Allow extra time • Repeat and clarify directions • Provide breaks in between tasks • Have student verbalize directions • Provide timelines/due dates for reports and projects	• Provide extra response time • Have student verbalize steps • Repeat directions • Provide small group instruction • Include partner work	• Provide reading material on student's level • Have student underline important points • Assist student on how to use context clues to identify words/phrases • Ensure short manageable tasks
Tests/Quizzes/Grading	**Behavior/Attention**	**Organization**
• Provide extended time • Provide study guides • Limit number of responses	• Establish classroom rules • Write a contract with the student specifying expected behaviors • Provide preferential seating • Re-focus student as needed • Reinforce student for staying on task	• Monitor the student and provide reinforcement of directions • Verify the accurateness of homework assignments • Display a written agenda

Enrichment

Accommodate Based on Students Individual Needs: Strategies

- Evaluate vocabulary
- Elevate Text Complexity
- Incorporate inquiry based assignments and projects
- Extend curriculum
- Balance individual, small group and whole group instruction
- Provide tiered/multi-level activities
- Include purposeful learning centers
- Provide open-ended activities and projects
- Offer opportunities for heterogeneous grouping to work with age and social peers as well as homogeneous grouping to provide time to work with individual peers
- Provide pupils with experiences outside the 'regular' curriculum
- Alter the pace the student uses to cover regular curriculum in order to explore topics of interest in greater depth/breadth within their own grade level
- Require a higher quality of work than the norm for the given age group
- Promote higher level of thinking and making connections.
- Focus on process learning skills such as brainstorming, decision making and social skills
- Use supplementary materials in addition to the normal range of resources.
- Encourage peer to peer mentoring
- Integrate cross-curricular lessons
- Incorporate real-world problem solving activities
- Facilitate student-led questioning and discussions

Career Ready Practices

Standards

CRP1, CRP2, CRP3, CRP4, CRP8, CRP9, CRP10, CRP12

- **CRP1. Act as a responsible and contributing citizen and employee.** 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.
- **CRP2. Apply appropriate academic and technical skills.** 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
- **CRP3. Attend to personal health and financial well-being.** 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 wellbeing, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.
- **CRP4. Communicate clearly and effectively and with reason.** 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.
- **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**
  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.
- **CRP9. Model integrity, ethical leadership and effective management.** Career-ready individuals 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.

- **CRP10. Plan education and career paths aligned to personal goals.** Career-ready individuals 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.
- **CRP12. Work productively in teams while using cultural global competence.** 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.

Educational Technology

Standards

8.1.2.A.1, 8.1.2.A.2, 8.1.2.A.3, 8.1.2.A.5, 8.1.2.B.1, 8.1.2.C.1, 8.1.2.D.1, 8.1.2.E.1, 8.1.2.F.1

- **Technology Operations and Concepts**
  - Identify the basic features of a computer and explain how to use them effectively.
  - Use technology terms in daily practice.
  - Discuss the common uses of computer applications and hardware and identify their advantages and disadvantages.
  - Create a document with text using a word processing program.
- **Creativity and Innovation**
  - Illustrate and communicate original ideas and stories using digital tools and media-rich resources.
- **Communication and Collaboration**
  - Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using electronic tools.
- **Digital Citizenship**
  - Model legal and ethical behaviors when using both print and non-print information by citing resources.
- **Research and Information Literacy**
  - Use digital tools and online resources to explore a problem or issue affecting children, and discuss possible solutions.
- **Critical Thinking, Problem Solving, and Decision-Making**
  - Use mapping tools to plan and choose alternate routes to and from various locations.