# Iowa Early Learning Standards - 3rd edition

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To Iowa early care and education providers, families, administrators, professional development staff, community partners, legislators, and all Iowa adults,

The vision of Early Childhood Iowa is “Every child, beginning at birth, will be healthy and successful.” We are proud and excited to support this important new resource - the Iowa Early Learning Standards - 3rd edition - for Iowa to achieve that vision. We invite you to use the standards to support each child in Iowa to reach his or her full potential. The quality of a child’s early experiences profoundly influences either a strong or a weak foundation for future learning and success.

Organizations, agencies, communities, and state government must work together to intentionally advance the well-being of our youngest children. The Iowa Early Learning Standards - 3rd edition provides a common understanding for what young children should know and be able to do. This set of standards is the result of the dedicated work of home childcare providers, childcare center staff, preschool - grade 12 educators and administrators, Area Education Agency professionals, parents and guardians, and state and national experts in early learning, health, mental health, nutrition, and home visitation and family support.

The Iowa Early Learning Standards - 3rd edition builds on the efforts of those who developed the 2006 and 2012 standards. The new document brings together standards and benchmarks for the age range of birth through the end of a child’s fifth year. It provides a continuum in developmentally and culturally appropriate standards. In addition, these standards are aligned with the Iowa CORE standards for the end of kindergarten to support the transition from early childhood into preschool - grade 12 education.

The Iowa Early Learning Standards - 3rd edition includes the most recent best practice and scientific research. We offer this tool to ALL adults in Iowa to promote positive interactions and environments for young children. As a result of using these standards, Iowa will benefit for years to come.

Sincerely,

David Arens
President
Early Childhood Iowa State Board

Brooke Axiotis
President
Iowa State Board of Education
Iowa Early Learning Standards Writing and Revision Committees

3rd edition Revision Committee

Mary Airy, Early Education Consultant (retired), Grant Wood Area Education Agency
Julee Albers, Director of Youth Impact, Community Foundation of Greater, Dubuque
Jeff Anderson, Early Childhood Iowa Office, Iowa Department of Management
Leann Andre, Child Care Consultant Supervisor, Child Care Resource & Referral of Central Iowa
Heidi Ball (ECI PD Health, Mental Health, Nutrition Co-Chair), Health & Nutrition Manager,
   Drake University Head Start
Amy Barth, Assistant Professor, School of Education, Buena Vista University
Sallee Beneke, Director of Master's in Early Childhood Education, St. Ambrose University
Tammy Bormann, Early Childhood Consultant and Instructor, Early Learning and Caring Resources, Urbandale
Jane Hall Chaillie, Assistant Professor of Education, Graceland University
Rachel Charlot, Early ACCESS Service Coordinator/Program Assistant, University of Iowa
Cindy Chettinger, Early Childhood Supervisor, Northwest Area Education Agency
Erin Clancy, Child Care Program Manager, Iowa Department of Human Services
Marcia De Graaf, Principal, Hospers Elementary, MOC - Floyd Valley Community School District
Jill Dods, Director, Simple Abundance Child Care, Coralville
Chris Evan-Schwartz, Program for Infant/Toddler Care Trainer, Kirkwood Community College
Kristy Fenwick, Dubuque County Parents as Teachers, Four Oaks, Dubuque
Tim Fitzpatrick, Family Development and Self Sufficiency Program Manager, Iowa Department of Human Rights
Amber Forrest, Early Childhood Director, Science Center of Iowa Preschool, Des Moines
Monica Garner, Early Childhood Program Coordinator, Drake University Head Start
Gaye Gronlund, Consultant and Author, ECE Consulting, Inc.
Delora Jesperson Hade, Professor, Early Childhood Education, Des Moines Area Community College
Sheila Hansen, Every Child Counts Director, Child and Family Policy Center
Kelly Hanson, Farm to Early Care and Education Specialist, Iowa Association for the Education of Young Children
Sally Hartley, Early Childhood Special Education Teacher/Consultant, Northwest Area Education Agency
Jillian Herink, Executive Director, Iowa Association for the Education of Young Children
Wendy Hoogeveen, Child Care Program Manager, Iowa Department of Human Services
Heidi Hibma, Kindermusik - Preschool Learning Center, Private Studio, Sioux Center
Heidi Hotvedt, Child Care Nurse Consultant Healthy Child Care Iowa Coordinator,
   Iowa Department of Public Health
Mary Janssen, Children and Family Services Director, Child Care Resource & Referral of Northeast Iowa
Laurie Jeffries, Head Start Training Specialist and Area Manager, District Preschool Monitor,
   North Iowa Community Action Organization, Mason City
Carrie Jones, Child Care Consultant, Child Care Resource & Referral of Northeast Iowa
Kris Kilibarda, State Science Supervisor, Iowa Department of Education
Brian Kingrey, Kindergarten Teacher, Sigourney Community School District
Sherri Koch, Preschool Teacher, Linn County Child Development Center, Cedar Rapids
Annette Koster, Local ECI Director, Buena Vista, Crawford, Sac Early Childhood Iowa
Aryn Kruse, Assistant Professor of Education, Simpson College
Lisa Laird, Children's Librarian/Puppeteer, Sioux Center Public Library/Pockets Full of Fun, Orange City
Gayle Luze, Associate Professor, Early Childhood Education, Iowa State University
Tami McCoy, Early Childhood Education Teacher, Hawkeye Community College
Katie McKenzie, Community Literacy Specialist, Visiting Nurse Services of Iowa
Barb Merrill, Executive Director (retired), Iowa Association for the Education of Young Children
Rae Miller, Child Health Specialty Clinics Program Manager, Child Health Specialty Clinics, Carroll
Deb Molitor, Early Childhood Consultant/School Psychologist (retired), Central Rivers Area Education Agency
Beth Nichols, Early Childhood Systems Specialist, Region VII Head Start
Miranda Niemi, Director, Rockwell Collins Child Development Center, Cedar Rapids
Melanie Nolssch, Professor/Coordinator, Kirkwood Community College
Sara Paar, Early Childhood Programs Mentor, Mid-Iowa Community Action, Marshalltown
Kevin Pokorny, Founder and Consultant, Pokorny Consulting, Des Moines
Sherri Peterson, Program Coordinator, Regents’ Center for Early Developmental Education - UNI
Dawn Powers (ECI PD Early Learning Co-Chair), Training Specialist,
   Child Care Resource & Referral of Southwest Iowa
Malisa Rader, Human Sciences Specialist, Iowa State University Extension and Outreach
Rhonda Rainden-Nelson (ECI PD Health, Mental Health, Nutrition Co-Chair), Community Health Consultant,
   Iowa Department of Public Health
Sarah Rankin, Student (graduate), Iowa State University
Lori Rawson, First Grade Teacher, Southeast Polk Community School District
Tom Rendon, Head Start State Collaboration Office, Iowa Department of Education
Brad Richardson, Research Director and Adjunct Associate Professor, University of Iowa School of Social Work
Rick Roghair, Professional Development Manager, Iowa Association for the Education of Young Children
Judy Russell, Director, Drake University Head Start
Dianna Saelens, Instructional Coach, College Community School District, Cedar Rapids
Brianna Sayre-Geiser, Early Childhood Consultant, Heartland Area Education Agency 11
Melissa Schnurr (ECI PD Executive Committee Co-Chair), Education Consultant (Early ACCESS/IDEA Part C),
   Iowa Department of Education
Andy Smith, Child Development Center Manager, House of Mercy, Des Moines
Carrie Sodders (ECI PD Executive Committee Co-Chair), Early Childhood Programs Director,
   Mid-Iowa Community Action, Marshalltown
Angela Stagg, Assistant Director, Positive Parenting at Trinity, Davenport
Lisa Stocksleger, Literacy Specialist, ECQuIP - Iowa Association for the Education of Young Children
Jennifer Thoma, Assistant Professor of Literacy and Early Childhood Education, Drake University
Wendy Hoogeveen, Child Care Program Manager, Iowa Department of Human Services
Sherry Vanderploen, Adjunct Professor - Early Childhood, Northwestern College
Angela Van Polen, Consultant, Bureau of Educator Quality, Iowa Department of Education
Kimberly Villotti, Administrative Consultant, Bureau of Standards and Curriculum, Iowa Department of Education
Tonya Weber, Head Start, Early Head Start, and CACFP Director, New Opportunities, Inc., Carroll
Amanda Winslow (ECI PD Early Learning Co-Chair), Early Childhood Education Program Consultant, Shared Visions,
   Iowa Department of Education

3rd edition Professional Development Committee
Laura Abbe, Early Childhood Programs Services Supervisor and Program Mentor,
   Mid-Iowa Community Action, Marshalltown
Crystal Abbe, Family Engagement Facilitator - Early Childhood Department, Des Moines Public Schools
Leann Andre, Child Care Consultant Supervisor, Child Care Resource & Referral of Central Iowa
Tammy Bormann, Early Childhood Consultant and Instructor, Early Learning and Caring Resources, Urbandale
Rob Brookhart, Instructional Designer, Iowa AEA Learning Online
Lavenia Coover, Head Start/Early Head Start Director, West Central Community Action, Harlan
Amy Curtis, Early Childhood Center Consultant, ECQuIP - Iowa Association for the Education of Young Children
Kristy Fenwick, Dubuque County Parents as Teachers, Four Oaks, Dubuque
Lisa Fernstrum, Preschool Teacher - Integrated Classroom, Rock Valley Community School District
Jillian Herink, Executive Director, Iowa Association for the Education of Young Children
Mary Alice McAtee, Health and Nutrition Assistant, Drake University Head Start
Tami McCoy, Early Childhood Education Teacher, Hawkeye Community College
Miranda Niemi, Director, Rockwell Collins Child Development Center, Cedar Rapids
Brenda O’Halloran, Child Care Recruitment & Retention Specialist, Child Care Resource & Referral of Central Iowa
Rick Roghair, Professional Development Manager, Iowa Association for the Education of Young Children
Brianna Sayre-Geiser, Early Childhood Consultant, Heartland Area Education Agency 11
Melissa Schnurr (ECI PD Executive Committee Co-Chair), Education Consultant (Early ACCESS/IDEA Part C),
   Iowa Department of Education
Jennifer Stritz, Early Childhood Center Consultant, ECQuIP - Iowa Association for the Education of Young Children
Lori Tapke, Child Care Consultant, Child Care Resource & Referral of Northeast Iowa
Joyce Vermeer, Early Childhood Consultant, Northwest Area Education Agency
Shannon Wilson, Early Childhood Specialist, New Staff Orientation Program Coordinator,
   Iowa State University Extension and Outreach
Amanda Winslow (ECI PD Early Learning Co-Chair), Early Childhood Education Program Consultant, Shared Visions,
   Iowa Department of Education

3rd edition Reviewers
Kimberly Brenneman, Ph.D., Program Officer, Education, Heising-Simons Foundation
   [Science Standards]
Lise Fox, Ph.D., Professor and Co-Division Director, Department of Child & Family Studies,
   College of Behavior & Community Sciences, University of Southern Florida
   [Social Emotional Standards]
Cindy Hoisington, Science Educator, Education Development Center, Boston
   [Science Standards]
Krista S. Scott, LICSW, Senior Director, Child Care Health Policy, Child Care Aware® of America
   [Physical Well-Being and Motor Development Standards]

2012 Iowa Early Learning Standards

2012 Planning Committee

Jeff Anderson, Early Childhood Iowa System Coordinator, Iowa Department of Management
Tammy Bormann, Early Childhood Iowa Professional Development Coordinator,
   Iowa Association for the Education of Young Children
Chad Dahm, Bureau Chief, Bureau of Child Care, Iowa Department of Human Services
Gretchen Hageman, Bureau Chief, Bureau of Family Health, Iowa Department of Public Health
Julie Ingersoll, Child Care and CCR&R Team Lead, Iowa Department of Human Services
Barb Merrill, Executive Director, Iowa Association for the Education of Young Children
Mary Schertz, Consultant, Iowa Department of Education
Christi Regan, Head Start Director, Hawkeye Area Community Action Project
Laurabelle Sherman-Proehl, Administrative Consultant, Iowa Department of Education
Catherine Swackhamer, Early Childhood Education Specialist 0-5, ICF International
2012 Review Facilitators

Tammy Bormann, Early Childhood Iowa Professional Development Coordinator, Iowa Association for the Education of Young Children
Dara Madigan, T.E.A.C.H. Counseling Specialist, Iowa Association for the Education of Young Children
Barb Merrill, Executive Director, Iowa Association for the Education of Young Children
Kevin Pokorny, Owner/Consultant, Pokorny Consulting

2012 Review and Writing Committee

Mary Ann Adams, Family and Consumer Sciences Consultant, Iowa Department of Education
Mary Airy, Early Childhood Consultant, Grant Wood Area Education Agency
Heather Anderson, Department Coordinator and Instructor in Early Childhood Education, Scott Community College
Tammy Bormann, Early Childhood Iowa Professional Development Coordinator, Iowa Association for the Education of Young Children
Dianne Casto, Retired, Head Start Director
Jacqueline K. Crawford, Education Professor, Simpson College
Cathy Eddy, ECE Consultant, Retired from Heartland Area Education Agency 11
Chris Evan-Schwartz, Teacher, Cedar Rapids Metro High School
Kristy Fenwick, Dubuque County Parents as Teachers, Four Oaks
Tim Fitzpatrick, FaDSS Program Manager, Department of Human Rights
Gabriela Gallentine, Director, Conmigo Early Education Center
Catherine Wilson Gillespie, Co-Chair of Teaching and Learning, Drake University
Amy Gulling, Teacher, Science Center of Iowa
Sally Hartley, Early Childhood Special Education Teacher/Consultant, Northwest Area Education Agency
Mary Janssen, Director, Child Care Resource & Referral of Northeast Iowa
Delora Jespersen Hade, Professor, Des Moines Area Community College
Kimberly Johnson, Education Consultant, Iowa Department of Education
Brian Kingrey, Kindergarten Teacher, Sigourney Community School District
Kathy Hall, Family & Education Support Coordinator, MATURA Head Start
Sheila Hansen, Every Child Counts Director, Child and Family Policy Center
Gayle Luze, Associate Professor, Iowa State University
Dara Madigan, T.E.A.C.H. Counseling Specialist, Iowa Association for the Education of Young Children
Pam Mahoney, Director, Stepping Stones Child Care Center
Pat McReynolds, Director, Wapello/Mahaska Early Childhood Iowa Board
Barb Merrill, Executive Director, Iowa Association for the Education of Young Children
Rae Miller, Registered Nurse, Child Health Specialty Clinics Early ACCESS State Liaison
Deb Molitor, Early Childhood Consultant, Area Education Agency 267
Melanie Nollsch, Professor, Kirkwood Community College
Kristie Ostrander, Program Coordinator School-Home Connection, Four Oaks
Sherri Peterson, Lead Teacher and Early Childhood Instructional Coach, Waterloo Community Schools
Dawn Powers, Training Specialist, Child Care Resource & Referral of Southwest Iowa
Malisa Rader, Family Life Program Specialist, Iowa State University Extension and Outreach
Christi Regan, Head Start Director, Hawkeye Area Community Action Project
Tom Rendon, Head Start State Collaboration Office, Iowa Department of Education
Mykala Robinson, SWVI Regulatory Program Manager, Iowa Department of Human Services
Judy Russell, Director, Drake University Head Start
Mary Schertz, Consultant, Iowa Department of Education
Brenda Spurgeon, Iowa Early Childhood Education Specialist, ICF International  
Catherine Swackhamer, Early Childhood Education Specialist 0-5, ICF International  
Sherry Vanderploeg, Director, Church of the Cross Preschool  
Jessica Vollmer, Early Learning Coordinator, Early Connections  
Beth Walling, Consultant, Early Childhood Consultations  
Becky Walters, Comprehensive Services Supervisor, Hawkeye Area Community Action Program  
Carolyn Wassenaar, Retired, Church of the Cross Preschool and Grand View University  
Cindy J. Weigel, Education Consultant, Iowa Department of Education  
Meghan Wolfe, Community Health Consultant, Iowa Department of Public Health  
Betty Zan, Professor, University of Northern Iowa  
Yuzhu Zheng, Postdoc Research Associate, Iowa State University

2006 Writing Committee

Joane Amick, Keystone Area Education Agency 1  
Alison Bell, Area Education Agency 267  
Karen Blankenship, Iowa Department of Education  
Donna K. Donald, Iowa State University Extension  
Nancy Dunn, Exceptional Persons, Inc.  
Cathy Eddy, Heartland Area Education Agency 11  
Julie Edwards, Upper Des Moines Opportunity, Inc.  
Kristi Engstrom, Tri County Child & Family Agency  
Kathy Erikson, Davenport Community Schools  
Kim Finch-Lear, Davenport Community Schools  
Jeanette Flagge, YOUR, INC. Head Start 0-5  
Rosemary Geiken, University of Northern Iowa; TLC Center  
Dee Gethmann, Consultant, Early Childhood, Iowa Department of Education  
Delora Jespersen Hade, Des Moines Area Community College  
Anita Hampton, Iowa State University Extension  
Sally Hartley, Western Hills Area Education Agency 12  
Susan Hegland, Associate Professor, Department of Human Development & Family Studies, Iowa State University  
Mary Hughes, Iowa State University Extension  
Dorothy Lifka, Child Guidance Center  
Patricia McReynolds, SIEDA Community Action Partnership  
Penny Milburn, Consultant, Early Childhood, Iowa Department of Education  
Jhumur Mukerjee, Caliber Associates, Region VII Head Start  
Lisa Naig, Loess Hills Area Education Agency 13  
Robin Nepper, Caliber & Associates, Region VII Head Start TA Specialist  
Melanie Nollsch, Kirkwood Community College  
Joanie O’Connor, Community Action Agency of Siouxland  
Marsha Platt, Child Care Resource & Referral of Northeast Iowa, Exceptional Persons, Inc.  
Christie Sales, University of Northern Iowa  
Brenda Spurgeon, Southern Iowa Economic Development Association  
Kim Stek, Mahaska Health Partnership  
Catherine Swackhamer, Iowa Head Start Technical Assistance Specialist, Caliber Associates  
Jill Uhlenberg, University of Northern Iowa Child Development Center  
Beth Walling, Iowa Child Care & Early Education Network, State Infant/Toddler Specialist  
Kim Young-Kent, Tri-County Head Start
Introduction
Iowa Early Learning Standards - 3rd edition
Defining the Iowa Early Learning Standards

There are approximately 2,000 days from when a child is born until she or he enters kindergarten. Nearly 90% of brain growth occurs during these 2,000 days, making this time period one of the most critical for learning (Brown & Jernigan, 2012). When adults know what young children need to learn during these 2,000 days, they can create appropriate situations, build healthy attachments, and provide experiences to support and nurture the best development by each child.

Early learning standards, also referred to as guidelines or expectations, define what children should know and be able to do during and by the end of the first 2,000 days of life. The Iowa Early Learning Standards (IELS) are guidelines to help achieve positive results for young children and families. The IELS serve as a structure for early childhood providers to make informed decisions that shape how we care for, and how we educate, our youngest citizens.

The IELS are designed for the following:

- inform families, professionals, and community leaders about what to expect young children to know and do
- assist families, professionals, and community leaders to provide high quality early care, health, and education experiences for all children
- guide learning and evaluation decisions by early childhood professionals in all public and private early care and education settings
- inform policy development to improve organizational and professional development systems
- unite expectations of program administration, early care and education, health, mental health, and family support professionals about child development and the importance of each child’s experiences

The IELS are not intended:

- for use as a checklist or assessment tool to evaluate children
- to label, sort, or diagnose children
- to exclude children from infant/toddler programs, preschools, kindergarten, or any early childhood program for which they are otherwise eligible
- to identify programs based on children’s high achievement
- to serve as a measure for program funding
- to evaluate teachers or caregivers

Early learning standards assist adults to understand what children should know and be able to do prior to entering kindergarten. The IELS emphasize developmental (age-level) appropriate processes, skills, content, and child outcomes. The intent of the IELS is to implement the standards with teaching and assessment strategies that are ethical and appropriate for young children. For full implementation, the standards require reinforcement with strong financial supports and resources from legislators, community leaders, and policy makers for early childhood programs, professionals, and families (NAEYC, 2002).
Sections of the Iowa Early Learning Standards 3rd edition

The Iowa Early Learning Standards (IELS) are for everyone who cares for, educates, and works with young children. The standards are a resource to support and enhance children’s learning and development. In addition, the standards are a tool to share information among families, caregivers, child care providers, family support, mental health, and health care professionals, teachers, program administrators, and others who care for or work with children during their first 2,000 days.

There are four sections to the Iowa Early Learning Standards - 3rd edition.

**Section 1 - Introduction**
- Defining the Iowa Early Learning Standards
- Components of the Iowa Early Learning Standards
- History of the Iowa Early Learning Standards
- Revisions to the Iowa Early Learning Standards - 3rd edition

**Section 2 - Essential Considerations**
- The Importance of Children’s Physical and Mental Health
- The Role of Relationships in Learning
- Embracing Diversity and Inclusion
- The Importance of Play in Learning
- The Role of Technology and Interactive Media
- The Role of Observation and Monitoring
- Understanding School Readiness

**Section 3 - Iowa Early Learning Standards**
- **area** - reflects the parts of growth and development for young children. The areas of development are connected to each other and integrate the development of the whole child. The areas provide a strong developmental foundation that represents the needs and capabilities of infants, toddlers, and preschool-age children. Within each of the eight areas, the standard, rationale, benchmarks, examples of benchmarks, and adult supports are identified within infant/toddler (infants 0 - 18 months and toddlers 18 months - 3 years) and preschool-age (3 - 5 years) groups.
- **standard** - provides the expectation of what an infant/toddler (birth - 3 years) or preschool (3 - 5 years) child should demonstrate.
- **rationale** - includes a description of the standard and the research that supports it.
- **benchmark** - defines the skills and behaviors infants, toddlers, or preschool-age children develop that demonstrate the standard.
- **example** - suggests how children can practice and/or show the identified benchmarks.
- **adult support** - provides recommendations that contribute to the care, learning, and development of infants, toddlers, and preschool-age children, using developmentally appropriate strategies - which should incorporate English and each child’s home language.
- **references** – provides details to access the research used to define the rationale and standards.
Section 4 - Alignment to the K-12 Iowa CORE

This section describes academic expectations for K-12 students in Iowa. It provides a broad comparison of the connections between early learning and school-age expectations for children. The alignment shows the areas and benchmarks of the IELS that serve as introductory learning for students to achieve expected skills in the K-12 school setting.

History of the Iowa Early Learning Standards

Early childhood leaders in Iowa continue to recognize the need for developmentally appropriate learning standards for children ages birth through five. The National Association for the Education of Young Children (NAEYC) defines developmentally appropriate practice, often shortened to DAP, as an approach to teaching, grounded in the research, on how young children develop and learn, and in what is known about effective early education. Its framework is designed to promote young children’s peak learning and development.

During 2005 and 2006, in response to federal requirements in the Good Start, Grow Smart Early Childhood Initiative and the Federal Child Care Development Fund, the Iowa Department of Education and the Iowa Department of Human Services jointly established a process and identified interested people to serve as the first Iowa Early Learning Standards Writing Committee. The first Iowa Early Learning Standards (IELS) were developed and formally adopted in 2006.

In 2010, early learning standards became a priority in the Head Start Early Childhood Advisory Council federal grant, which resulted in an update of the Iowa standards in 2012. As part of the Child Care Development Block Grant (CCDBG) federal rules, it was required to determine guidelines for continual review of early learning standards in each state. As a result, Early Childhood Iowa decided to review the Iowa Early Learning Standards every five years. In 2017, the Iowa Early Learning Standards Update Committee identified the importance of the following goals to guide their work:

- honor the quality work completed in 2006 by the original writing committee by making updates and revisions only as needed
- use the National Association for the Education of Young Children (NAEYC) Principles of Child Development and Learning as guiding principles (Copple and Bredekamp, 2009)
- design a user-friendly document for use by everyone who works with young children
- provide alignment across the K-12 Iowa Core, Head Start Early Learning Outcomes Framework, Teaching Strategies GOLD, and other applicable documents used within Iowa
- use the IELS to impact policies and procedures at local and state levels
- provide professional development opportunities aligned with the IELS
- use current research to define what children should know and be able to do
- impact the Early Childhood Iowa Professional Development framework, including early learning, family support, and health/mental health/nutrition, including special needs and early intervention
- build a seamless continuum with the K-12 Iowa Core to provide standards from birth-12th grade
Iowa Early Learning Standards 3rd edition Revisions and Updates

The 2017 Iowa Early Learning Standards Update Committee included more than 60 individuals from every region of Iowa who represented a variety of positions within early care and education. The Update Committee reviewed the K-12 Iowa Core, Head Start Early Learning Outcomes Framework, and Teaching Strategies GOLD® Objectives for Development and Learning, and considered the current Iowa situation. The Update Committee also reviewed recent and updated research and theory in child development and early education. After this review, the Update Committee chose to separate the areas of mathematics and science. The Iowa Early Learning Standards - 3rd edition, as updated in 2017, include the following eight areas:

Additional and more current research was added throughout the IELS - 3rd edition update. Social Studies is aligned with the updated K-12 Iowa CORE standards. Communication, Language, and Literacy includes a stronger emphasis on dual language learners. National experts provided comments and input.

Access the Iowa Early Learning Standards - 3rd edition
Iowa Association for the Education of Young Children: http://www.iowaeyc.org/iowa-early-learning-standards.cfm
Essential Considerations
Iowa Early Learning Standards - 3rd edition
The Intent of the Essential Considerations

The intent of the Iowa Early Learning Standards is to create an understanding of how children develop and learn. The standards define age appropriate expectations to provide a framework when designing developmentally appropriate teaching and learning experiences.

In 2016, the Early Childhood Iowa Professional Development Component Group developed the Iowa Core Knowledge of Child Development (http://www.iowaaeyc.org/iowa-core-knowledge-of-child-development.cfm) to assist adults with ideas to increase their knowledge and their ability to appropriately respond to children in their lives. The information reflects the principles of child development from the National Association for the Education of Young Children (NAEYC). The following eight statements define the foundational information that all adults who have a role in a child’s development - whether a child care provider, parent or guardian, “baby sitter,” grandparent, health care professional, retail checker, secretary in a business where a family may visit, or any other role as a positive adult in the life of a child (Early Childhood Iowa, 2016):

- Play is learning
- Children are influenced by their family, community, and cultural experiences
- Balanced nutrition, adequate sleep, and physical activity help children grow
- Early experiences and relationships have profound effects on brain development
- Children develop best when they have secure and positive relationships
- Children learn in a variety of ways
- All areas of development and learning are important
- Learning and development occur in a specific order, but at differing rates

Children learn from everything they experience, which impacts all areas of development at the same time. The play, learning, communication, and relationships children encounter in their first five years lay the foundation for learning throughout the rest of their lives. When children are exposed to age-appropriate learning experiences, many opportunities for play, and nurturing relationships within family and early care and education settings, they are better prepared for learning and for getting along with others when they enter school.

NAEYC defined child development and developmentally appropriate guidelines for working with young children using early childhood research and theory. Developmentally appropriate practice defines the materials, equipment, skills, and strategies necessary for quality early learning and caring experiences (Copple & Bredekamp, 2009). Positive relationships, meaningful experiences, play, and active hands-on use of materials help children create their own understanding of the world. Adults pay close attention to each child's individual and social needs, and then adjust situations so each child is successful in his or her own way. These practices serve as the foundation for the Iowa Early Learning Standards.

While implementing the Iowa Early Learning Standards, it is important that caring adults consider topics from developmentally appropriate practice to make decisions about children from birth through five years of age.
The Role of Relationships in Learning

Building nurturing relationships with children assists in the formation of positive attachment. Attachment is the strong emotional bond formed between a child and a caring adult who is a part of the child’s everyday life. "Strong attachment relationships between children and the adults who care for them are critical to early brain development. All children need nurturing, responsive adults who they can trust to care for them as they grow and learn. If a child’s needs are met, the child forms a secure attachment – a base – that creates a foundation for healthy development in early childhood and beyond. When early relationships are nurturing, individualized, responsive, and predictable, they increase the odds of desirable outcomes – building healthy brain architecture that provides a foundation for learning, behavior, and health. Young children with a weak early foundation have an increased risk for problems later, when they will need to build on those basic capabilities established in the early years to develop more complex skills" (Schumacher & Hoffman, 2008).

Caring adults need to actively involve themselves in observing, helping, and extending children’s play during child-initiated play activities. As adults circulate among children during play, they can observe the play and interactions, engage in conversations with children about their play and experience, and support children’s problem solving efforts. Responsive adults guide children’s communication and mental development with timely and appropriate questions; both open-ended (how, why, and what-if questions) and more specific ‘yes’ or ‘no’ questions. High quality instructional support provides quality feedback, builds children’s learning, and increases knowledge that makes a difference in school readiness and future academic success. Each early learning standard includes examples of adult supports that guide development through timely, responsive, and appropriate interactions with the child.

Families are children’s crucial caregivers and first teachers, and partners in early care, health, and education programs. Creating partnerships with families is essential to ensure that children receive the best learning experiences within and outside the home. All adults involved in a child’s day should exchange observations and information every day in order to plan and respond appropriately to the child’s needs. In addition, when young children are in early care or education settings outside of the home, it is best to set up caregiving and relationship routines rooted in the familiar cultural background of the family.

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What Relationships Means for Families

1. Families are children’s first teachers. During play, families can observe the play, encourage children to continue in their play, participate in play, ask open-ended questions, and use brief conversation to share in the joy of the children’s discoveries.
2. Families provide their children with learning opportunities throughout their waking day, using whatever materials and routines they have at hand. When their children cannot complete a task, the family member provides “just enough” help to allow for success.
3. Families are equal partners with other adults who work with their children. Families share observations about their children's activities at home, and their opinions and expectations must hold a high priority when other adults who work with their children plan for their children.
The Importance of Physical and Mental Health

Children learn best when they are healthy, safe, free of hunger, and have nurturing caregivers. Well-child visits at an established medical home and regular dental care at a dental home provide an important review of development, behavior, mental well-being, immunizations, oral health, vision, and hearing. Balanced nutrition, adequate sleep, and physical activity help children grow, and set the stage for healthy habits and lifelong learning. Infants, toddlers, and preschoolers must have basic needs met in order to be ready to learn.

Consistent routines and experiences that happen about the same time and in about the same way each day provide comfort and a sense of safety to young children. Familiar routines allow children to predict what will happen next, which allows them to feel a sense of control over the events in their lives. Routines also provide opportunities for building relationships, self-control, curiosity, vocabulary, and learning in all areas of development (ZERO TO THREE, 2008).

Early childhood mental health is sometimes referred to as social and emotional development. Mental health in the early years includes the ability to form relationships with adults and other children, to experience and manage emotions, and to explore environments and learn—all in the family, community, and cultural setting (Cohen, Onunaku, Clothier, & Poppe, 2005). Nurturing relationships are key to the formation of positive mental health.

Children's mental health is at risk if they are exposed to events or environments that harm social, intellectual, and emotional functioning. These types of negative events, such as abuse or neglect, are known as Adverse Childhood Experiences (ACEs) and can impact a child for her or his entire life. The ACE study was conducted by Dr. Robert Anda and Dr. Vincent Felitti in 1995 and 1997. The findings, combined with results of physical exams and tracking of participant health experiences, showed a powerful connection between harmful experiences in childhood and poor adult health status decades later. "The experiences children have early in life, and the environments in which they have them, shape their developing brain architecture and strongly affect whether they grow up to be healthy, productive members of society" (Gudmunson, Ryherd, Bougher, Downey, & Zhang, 2013).

It is important to consider each child, individually, in all areas of a child’s development, including physical and mental health. Early care, education, health, mental health, and family support providers must possess awareness of a child’s health in order to individualize and promote overall development and well-being. Consistent daily care and learning experiences in healthy, nurturing, and safe environments foster the development of each child, with the flexibility to capture the interests of the children and individual abilities of each child.
What Physical and Mental Health Means for Families

Find a trusted primary health care provider and dentist who know your child and become familiar with her or his needs.

1. Keep adult and child vaccines current to assist in preventing illnesses.
2. Help your child grow and develop by providing balanced, nutritious meals, including breast milk for babies, and regular naps and bedtimes.
3. Support the physical development of your child by providing at least 60 minutes of active play indoors and outdoors per day.
4. Support the mental development of your child by responding to her or his needs and by providing a safe, stable, predictable, and compassionate environment.
5. Prevent many significant injuries to your child by providing careful supervision at all times.
6. Speak to your child in nurturing ways and take time to understand his or her needs by watching your child during regular routines and play.
7. Provide safe sleep environments for children. Place your baby on her or his back to sleep in a crib with no blankets, bumper pads, or toys until the first birthday. It is dangerous for babies to sleep in car seats that are outside a vehicle, bouncy seats, baby swings, or adult beds.
8. Help keep your child healthy by washing hands before making meals and snacks, eating, feeding a child, after using the bathroom, after changing diapers, after assisting in the bathroom, and after wiping a nose.

Diversity and Inclusion

Diversity refers to the characteristics that make an individual unique. It includes age, culture, abilities, education, family mobility (transient, military, migrant, homeless), family composition, sexual orientation, gender, language, race/ethnicity, region, religion, and socio-economic status/class (Early Childhood Iowa, 2011). The Iowa Early Learning Standards - 3rd edition are designed to identify standards and benchmarks with adult supports for all children.

Children need early care and education programs that respect diversity, support children’s ties to their families and community, and promote development of children’s cultural identity. Because the population of Iowa young children is more diverse than the state population as a whole, caring adults can foster inclusion and acceptance by gaining cultural knowledge about families. This knowledge assists with program practices, including learning key words and phrases from a child’s home language. When a child’s cultural and language backgrounds are used, learning is more meaningful and effective. This is the heart of individualized care.
Adults who respond to the culture and language of children intentionally recognize, embrace, and celebrate diversity to promote success for all children. This comes through respecting and understanding the diverse traditions and values of the children and families. Caring adults actively involve families in programs that respect differences and avoid stereotypes. Through activities, materials, foods, books, dances, songs, art, and celebrations, children develop pride in the traditions of their own family and community, as well as respect for the traditions of others.

Caring adults develop settings and situations that welcome all children and their families. Programs must strive to implement family-centered practices that reflect the values and goals of each family. Adults encourage each child with varying abilities to fully participate in program experiences and daily routines using visual, verbal, and physical cues, as needed, to communicate and interact effectively.

Embracing diversity also includes respecting children with varying abilities and their families. Children with physical, social, emotional, health, and/or communication needs may require individualized supports, adaptations, and accommodations to fully access early care and education. Legally, non-family caring adults are required by the Americans with Disabilities Act (ADA) to make reasonable attempts to accommodate individuals with disabilities.

<table>
<thead>
<tr>
<th>What Diversity and Inclusion Means for Families</th>
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<tbody>
<tr>
<td>1. Families can expect adults in early care, health, and education settings and those who visit families in their homes, to respect and honor their culture.</td>
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<tr>
<td>2. When asked, families can share aspects of their culture with their children’s peers.</td>
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<tr>
<td>3. Families can expect efforts to make printed materials in their native language or read to them by a competent interpreter.</td>
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<tr>
<td>4. Families of children with identified special needs can seek out caring adults in early care and education settings that make accommodations for their children to fully participate in experiences made available to other children.</td>
</tr>
<tr>
<td>5. Families must look for early care and education programs that employ competent, educated, and nurturing adults who provide individualized instruction to increase the development of skills and concepts in their children.</td>
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</tbody>
</table>
What Diversity and Inclusion Means for Teachers and Other Caregivers

1. Provide opportunities and support to assist interaction between children with varying abilities and developmental levels.
2. Develop opportunities for new and specific experiences to meet individual needs.
3. Form routines and other naturally occurring events to help children learn or practice new skills.
4. Develop experiences and materials to provide independent participation by each child.
5. Offer minimal assistance for each child to succeed.
6. Provide encouragement and comments that help the child see the link between his/her effort and the result of the task.
7. Develop opportunities for children to function as leaders or models for their peers.
8. Design room arrangements that make materials and experiences clearly available and accessible to all children.
9. Make adaptations to ensure the setting is fully accessible.
10. Use specific adaptive materials and equipment that provide additional support.
11. Label and/or color-code materials to help with recognition, selection, or use.
12. Modify equipment or tools to increase independent use.
13. Provide adult or peer support, such as an associate teacher or peer buddy, to increase interactions with other children or the use of materials.

The Importance of Play

Play is important for the ideal development of every child. Play is included as a right of every child in the United Nations Convention on the Rights of the Child (Committee of the Rights of the Child, 2013). Research shows, and continues to explore and support, the basic value and positive benefit of play as a helpful approach to learning for young children (Hyson, n.d.; Lifter, Foster-Sanda, Arzamarski, Briesch, & McClure, 2011). The most recent position statement on Developmentally Appropriate Practice in Early Childhood Programs Serving Children Birth through 8 (NAEYC, 2009) describes that the initial and long-term benefits of play include development of self-control (self-regulation skills), language, reasoning, and social skills.

Play is essential for infants, toddlers, and preschool age children to develop healthy active brains, bodies, and relationships (Ginsburg, 2007). Play must be a natural method for learning in early care and education programs. Children learn about themselves and the world through self-created experiences and positive social interactions with other children and nurturing adults. Children need time, space, supportive adults, open-ended materials (encourage creativity), and safe, yet challenging environments. As a result, children develop confidence in themselves; abilities to master their environment; deep-seated ties to and caring about others; and the ability to create environments of love, safety, security, and resilience (Ginsburg, 2007).
Children enrolled in highly academic programs dominated by teacher-directed activities may become academically prepared for the first years of school. However, research verifies that a healthy balance between preparing for the future and living fully in the present through child-centered and organized play experiences; and caring adult-child connections better prepare children for life - emotionally, socially, and academically (Elkind, Clemens, Lewis, Brown, Almon, & Miller, 2009; Ginsburg, 2007; Gopnik, 2012; Miller & Almon, 2009). All children need the support of nurturing and caring adults who understand, value, and provide opportunities for play in ways that enable the access of their inborn motivations to understand or do what is just beyond their current understanding or mastery to encourage growth.

The Iowa Early Learning Standards emphasize the importance of play in learning by integrating play into every content area of development, using examples of both indoor and outdoor play, to show how adults can support children’s natural inclinations, motivations, joy, and learning. Play is natural. Play is meaningful. Play is joyful. Play is essential as we engage and prepare young children for their future.

Adults best support play when they believe and practice the following:

- value child-initiated play and recognize that play is learning
- balance child-initiated play with appropriate levels of adult guidance
- provide adequate time and space for infants, toddlers, and preschool age children to experience the joy of exploring and discovering their world through play
- recognize play as a demonstration of what children know and are thinking
- link inside environments to outside environments to provide settings where new knowledge is built about objects, people, and events
- understand that play is not about the toy - but about the act, the experience, the process, or the outcome
- use play intentionally to support children’s learning and development
- use play behaviors to observe and document what children know and can do
- base curriculum on play
- use play as an intervention to enable children’s progress and development of increasingly complex levels of play
- use play to promote children’s positive approaches to learning (Hyson, n.d.)
- recognize that play is developmental and deserves consideration within all domains of development (Lifter, Foster-Sanda, Arzamarski, Briesch, & McClure, 2011)

Families can provide toys to encourage open-ended play. Open-ended toys have a variety of uses and support creativity in children. Open-ended toys include blocks, play dough, objects to sort, paper, and all types of writing and drawing tools that allow and encourage creativity. As families observe, describe, and ask open-ended questions about child play, they build the skills necessary for their children to understand the world and how to interact with others.
As families seek appropriate early care and education settings for their children, it is important to look for environments where the child care center or home provider setting encourages child-initiated play. The schedule must provide many opportunities for children to play by themselves or in small groups, where they can learn from each other. Rather than worksheets, coloring pages, or cut and paste activities, families can expect art creations which are unique to each child. These creations invite children to use expanding vocabulary to describe the creative process and the result of their efforts.

**What Play Means for Families**

It is vital for families to recognize the importance of child-initiated play, whether at home or in early care and education settings. Play supports children’s curiosity and develops their knowledge about why things work the way they do. Families need to understand that through play, their children explore and practice many important skills, including:

- movement of their whole bodies (large muscle)
- movement of fingers and hands (small muscle)
- getting along with friends (social and emotional development)
- solving problems (mathematics)
- speaking and listening (communication, language, and literacy)

**The Role of Technology and Interactive Media**

Children can learn about technology when provided opportunities to explore and experience media in age-appropriate ways (Roskos, Burstein, You, Brueck, & O’Brien, 2011). It is essential during technology exploration that adults are present to supervise, to interact with children, and to frame the learning. This helps children understand what they view and to apply it to the world around them (Labbo, 2009; Turbill, 2001). The American Academy of Pediatrics (AAP) discourages all screen media for children less than 18 months of age, except video chatting with the assistance of a caring adult. For children ages 18-24 months, it is recommended that caregivers use high quality, educational media and use that technology to interact with the child. Further, children two to five years of age should be limited to one hour per day of high quality screen time, alongside a caring adult who can help them understand what they view and how to apply it to the world around them (AAP, 2016).
Key messages by the National Association for the Education of Young Children (NAEYC) and Fred Rogers Center position statement on technology (2012) include:

- when used intentionally and appropriately, technology and interactive media are effective tools to support learning and development
- intentional use of technology requires early childhood teachers and administrators to have information and resources regarding the nature of the tools and the implications of use with children
- limitations on the use of technology and media are important
- special considerations are necessary to the use of technology with infants and toddlers
- attention to digital citizenship and suitable access is essential
- need for ongoing research and professional development

**What the Use of Technology and Interactive Media Means for Families**

1. Families know that technology is a part of our culture and an important tool for communication and learning. However, technology is not a substitute for one-on-one time with family members. Intentional use of technology can support children’s development in areas such as literacy, mathematics, and science.
2. Families can provide opportunities for children to use technology together, such as reading digital storybooks or watching a favorite developmentally appropriate children's show together.
3. It is critical that families protect children from excessive amounts of ‘screen time,’ as well as inappropriate media, such as violent programs. Instead, families must recognize that children learn through play, and providing extended periods playing with their children is important.
4. Restricting use of technology during meals and for one hour before bedtime is recommended (AAP, 2016).

**The Role of Observation and Monitoring Child’s Development**

All caring adults need to observe each child’s development on an on-going basis. Continuous observation:

- identifies activities, interactions, materials, and instruction that assist in the next steps of development for each child
- guides communication with families and professionals regarding the development of the child, including any concerns
- provides information when other resources, including assessments by specialists, are needed
- assists programs to improve educational and developmental interventions by examining the growth of groups of children
It is important for those who provide care and education for children to work with families to observe and monitor each child’s development. Consistent patterns of behavior that occur over time during many situations are discussed while considering the cultural context in which the child is developing. Periodically, families and caring adults meet to more formally review the child’s growth and progress in order to plan for future programming. Any concerns regarding the child’s development begin with either the family or the adult provider. A relationship of mutual trust between adult providers and families is important for dealing with any concerns in a timely and positive manner.

Observation is one of the most common methods of assessment of children’s knowledge, skills, and motivations. Recorded observations verify children demonstrating skills and understanding at times and in settings where they occur naturally. Ongoing observations and assessments of the young child in multiple settings, including home, school, and during routine activities and play, give families and child care providers the opportunity to work together and to provide evidence of a child’s development. Young children usually show development that is more advanced in a familiar situation, using familiar materials, and during self-selected activities (Meisels & Atkins-Burnett, 2000).

### What Observation and Monitoring Means for Families

1. Families can expect their children’s development is monitored by early care, health, family support, and education programs. This monitoring is done through brief screening, which usually looks at broad areas of development and learning.
2. Families are valuable sources of information. Families can expect to partner with early care, health, and education programs to share their insights and observations of what their children think, know, and can do. This approach encourages everyone to work together as a team to determine what children know and what they are ready to learn next.
3. Families whose home language is not English can expect their children are screened in their home language, when possible. They can also expect results are provided in a manner that is easy and meaningful to understand.

### Understanding School Readiness

School readiness includes the readiness of the individual child, the school’s readiness for children, and the ability of the family and community to support ideal early child development (High, 2008). School readiness is not determined by looking at the child alone nor should we measure school readiness only by knowledge of math and literature. Gathering pertinent information includes a comprehensive, developmentally, and educationally important set of goals, rather than a narrow set of skills (NAEYC, 2003). To have rewarding and successful daily experiences, as well as to prepare for successful, responsible experiences, each child needs the following:

- access to high quality early care and education experiences
- health care, nutrition, and social-emotional nurturing
- caring adults with the skills, understanding, and resources to foster development
Families and communities need to provide each child with safe, nurturing, nourishing, and healthy environments that are developmentally, individually, and culturally appropriate. Early care and education settings, including kindergartens, must become ready to serve a population of children and families from diverse cultures and with diverse abilities.

<table>
<thead>
<tr>
<th>What Readiness Means for Families</th>
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<tbody>
<tr>
<td>1. Families must know overall health and well-being, social and emotional skills, language development, and enthusiasm and curiosity for learning, are all important elements of school readiness.</td>
</tr>
<tr>
<td>2. Besides looking at the whole child when thinking about kindergarten readiness, it is important for families, caregivers, and early education professionals to think about what type of kindergarten experience is available for children and who can help children with the transition to kindergarten.</td>
</tr>
<tr>
<td>3. Families must know the only requirement in Iowa for attending kindergarten is that a child is 5 years old by September 15 of the year he or she start kindergarten.</td>
</tr>
<tr>
<td>4. Families concern about their children’s future success in kindergarten can ask for assistance to find appropriate supports and early care opportunities for children.</td>
</tr>
<tr>
<td>5. Families can request the home provider or early care and education program, and the school district, to prepare a shared transition plan for their child and family.</td>
</tr>
</tbody>
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Index

Standards and CORE Alignments

Iowa Early Learning Standards - 3rd edition
Area 1: Social and Emotional Development

Standard 1.1 Self
1.1.IT Infants and toddlers display a positive sense of self.
1.1.PS Children express a positive awareness of self in terms of specific abilities, characteristics, and preferences.

Standard 1.2 Self-Regulation
1.2.IT Infants and toddlers show increasing awareness of and ability to express emotions in socially and culturally appropriate ways.
1.2.PS Children show increasing ability to regulate behavior and express emotions in appropriate ways.

Standard 1.3 Relationships with Adults
1.3.IT Infants and toddlers relate positively with significant adults.
1.3.PS Children relate positively with significant adults.

Standard 1.4 Relationships with Children
1.4.IT Infants and toddlers respond to and initiate interactions with other children.
1.4.PS Children respond to and initiate appropriate interactions with other children and form positive peer relationships.

IT = Infant and Toddler (birth - 3 years)
PS = Preschool (3 - 5 years)
Area 2: Physical Well-Being and Motor Development

Standard 2.1 Healthy and Safe Living
  2.1.IT Infants and toddlers participate in healthy and safe living practices.
  2.1.PS Children understand healthy and safe living practices.

Standard 2.2 Large Motor Skills
  2.2.IT Infants and toddlers develop large motor skills.
  2.2.PS Children develop large motor skills.

Standard 2.3 Small Motor Development
  2.3.IT Infants and toddlers develop small motor skills.
  2.3.PS Children develop small motor skills.

Area 3: Approaches to Learning

Standard 3.1: Curiosity and Initiative
  3.1.IT Infants and toddlers express curiosity and initiative in exploring the environment and learning new skills.
  3.1.PS Children express curiosity, interest, and initiative in exploring the environment, engaging in experiences, and learning new skills.

Standard 3.2 Engagement and Persistence
  3.2.IT Infants and toddlers purposefully choose, engage, and persist in play, experiences, and routines.
  3.2.PS Children purposefully choose and persist in experiences and play.

Standard 3.3 Reasoning and Problem Solving
  3.3.IT Infants and toddlers purposefully demonstrate strategies for reasoning and problem solving.
  3.3.PS Children purposefully demonstrate strategies for reasoning and problem solving.

Standard 3.4 Play and Senses
  3.4.IT Infants and toddlers engage in play to learn.
  3.4.PS Children engage in play to learn.

IT = Infant and Toddler (birth - 3 years)
PS = Preschool (3 - 5 years)
Area 4: Social Studies

Standard 4.1 Awareness of Family and Community
4.1.IT Infants and toddlers demonstrate a sense of belonging within their family, program, and other social settings or groups.
4.1.PS Children demonstrate an increasing awareness of belonging to a family and community.

Standard 4.2 Awareness of Culture
4.2.IT Infants and toddlers demonstrate a strong sense of self within their culture.
4.2.PS Children demonstrate an increasing awareness of culture and diversity.

Standard 4.3 Exploration of the Environment
4.3.IT Infants and toddlers explore new environments with interest and recognize familiar places.
4.3.PS Children demonstrate an increasing awareness of the environment in which they live, especially how people (including themselves) relate to that environment.

Standard 4.4 Awareness of Past
4.4.PS Children demonstrate an increasing awareness of past events and how those events relate to one’s self, family, and community.

Area 5: Creative Arts

Standard 5.1 Art
5.1.IT Infants and toddlers participate in a variety of sensory and art-related experiences.
5.1.PS Children participate in a variety of art and sensory-related experiences.

Standard 5.2 Music, Rhythm, and Movement
5.2.IT Infants and Toddlers participate in a variety of rhythm, music, and movement experiences.
5.2.PS Children participate in a variety of music and movement experiences.

Standard 5.3 Dramatic Play
5.3.IT Infants and toddlers engage in dramatic play experiences.
5.3.PS Children engage in dramatic play experiences.

IT = Infant and Toddler (birth - 3 years)
PS = Preschool (3 - 5 years)
Area 6: Communication, Language, and Literacy

Standard 6.1 Language Understanding and Use
6.1.IT Infants and toddlers understand and use communication and language for a variety of purposes.
6.1.PS Children understand and use communication and language for a variety of purposes.

Standard 6.2 Early Literacy
6.2.IT Infants and toddlers engage in early reading experiences.
6.2.PS Children engage in early reading experiences.

Standard 6.3 Early Writing
6.3.IT Infants and toddlers engage in early writing experiences.
6.3.PS Children engage in early writing experiences.

Area 7: Mathematics

Standard 7.1 Comparisons, Numbers, and Operations
7.1.IT Infants and toddlers show increasing understanding of comparisons and amount, including use of numbers and counting.
7.1.PS Children understand counting, ways of representing numbers, and relationships between quantities and numerals.

Standard 7.2 Patterns
7.2.IT Infants and toddlers begin to recognize patterns.
7.2.PS Children understand patterns.

Standard 7.3 Shapes and Spatial Relationships
7.3.IT Infants and toddlers show increasing understanding of spatial relationships.
7.3.PS Children understand shapes and spatial relationships.

Standard 7.4 Measurement
7.4.PS Children understand comparisons and measurements.

Standard 7.5 Data Analysis
7.5.PS Children demonstrate the process of data analysis by sorting and classifying, asking questions, and finding answers.

IT = Infant and Toddler (birth - 3 years)
PS = Preschool (3 - 5 years)
Area 8: Science

Standard 8.1 Scientific Investigations
8.1.IT Infants and toddlers gather and interpret information from the environment around them.
8.1.PS Children gather information and conduct investigations to address their wonderings and test solutions to problems.

Standard 8.2 Scientific Reasoning
8.2.IT Infants and toddlers use reasoning to make sense of information in their environment.
8.2.PS Children use reasoning to make sense of information and design solutions to problems in their environment.

Standard 8.3 Scientific Communication
8.3.IT Infants and toddlers share information and understanding about experiences in their environment.
8.3.PS Children share information and understanding about experiences in their environment.

IT = Infant and Toddler (birth - 3 years)
PS = Preschool (3 - 5 years)
Rationale
Iowa Early Learning Standards - 3rd edition
Area 1: Social and Emotional Development

Self - Infant and Toddler (birth - 3 years)

Standard 1.1.IT Infants and toddlers display a positive sense of self.

Rationale - Why is this important for a child?

For very young children, acceptance, emotional attachment, and ongoing nurturing are the primary basis for a positive sense of self. A sense of self includes self-recognition and self-esteem. The way adults relate to infants and toddlers influences the way they grow up to view themselves. Using a child’s name while talking with him or her helps the child realize he or she is a separate individual. Caring adults who provide safe, stable, predictable, and compassionate environments support infants’ and toddlers’ growing independence and promote a healthy sense of self, as well as connections with others. Infants and toddlers learn they can make things happen and begin to initiate activities. Infants usually prefer adults who imitate their activities (Meltzoff, 1990). Infants will show more positive helping behaviors toward adults who imitate them (Carpenter, Uebel, & Tomasallo, 2013). Young infants begin to recognize themselves and to tell the difference between themselves and others by four months of age (Rochat & Striano, 2002).

During the second year, most toddlers display deeper levels of self-awareness when they show recognition of images of themselves (Rochat, Broesch, & Jayne, 2012). They also demand the right to make some independent choices and to refuse some experiences (Bullock & Lütkenhaus, 1988). Making choices helps develop a sense of independence and autonomy, but it is also important to keep the choices manageable because too many choices can become overwhelming. Infants and toddlers usually learn to choose activities they can do successfully, but rely heavily on adult reactions to their actions (Stipek, Gralinski, & Kopp, 1990). Caring adults foster development of self by imitating infants and by respecting their choices (Bronson, 2000). Toddlers develop self-awareness and self-understanding based on the evaluations of others, especially those adults to whom the child is attached emotionally (Thompson, 1991). Adults need to accommodate each child’s distinct blend of personality characteristics, interests, and abilities.
## Area 1: Social and Emotional Development

### Self - Preschool (3 - 5 years)

| Standard 1.1.PS | Children express a positive awareness of self in terms of specific abilities, characteristics, and preferences. |

### Rationale - Why is this important for a child?

One of the most important goals of the preschool years is helping children develop a positive self-concept and self-esteem (Kagan, Moore, & Bredekamp, 1995). Self-concept is the perception that one is capable of successfully making decisions, accomplishing tasks, and meeting goals. “The goal of using these intentional steps is to help the child establish a positive schema - or concept - for who he/she believes him/herself to be” (Durkin, 2016, p.5). Children need to feel valued.

Young children typically overestimate their own abilities. At the same time, they equate effort and ability, assuming that failure represents both a lack of effort and ability (Nicholls, 1978). After repeated failures, some young children already acquire learned helplessness, a belief they cannot succeed in anything they try. Learned helplessness (Dweck & Licht, 1980) affects later learning. Therefore, it is essential to help young children see themselves as capable learners, to develop resilience (flexibility), and to instill genuine feelings of success. During the preschool years, it is important for a child to develop a positive self-concept, not by telling the child he or she is special, but by taking initiative and succeeding at challenging tasks while also receiving adult encouragement (Peth-Pierce, 2000).

“Children who cannot effectively regulate anxiety or discouragement tend to move away from, rather than engage in, challenging learning activities. On the contrary, when children regulate uncomfortable emotions, they can relax and focus on learning thinking skills. Similarly, children experience better emotional regulation when they replace thoughts like ‘I’m not good at this’ with thoughts like ‘This is difficult, but I can do it if I keep trying.’ Regulating anxiety and thinking helps children persist in challenging activities, which increases their opportunities to practice the skills required for an activity” (Florez, 2011, p.47).

All children need opportunities to make choices. Therefore, it is important for adults to provide opportunities to help build children’s emotional regulation. Learning to make choices allows a child to grow and to develop into an independent person, one that is connected with her or his parents, family, community, and society.
Area 1: Social and Emotional Development

Self-Regulation - Infant and Toddler (birth - 3 years)

Standard 1.2.IT Infants and toddlers show increasing awareness of and ability to express emotions in socially and culturally appropriate ways.

Rationale - Why is this important for a child?

Self-regulation refers to the abilities of infants to respond in an organized and effective way to events in their world, and to become aware of their emotions in order to help them understand what they need and want, and how to get it in socially acceptable ways. From birth, infants and toddlers show individual differences in the ability to self-regulate. Self-regulation is one component of temperament (Thomas, Chess, & Birch, 1970). Self-regulation, as a ‘cornerstone for early childhood development,’ and is possible to observe in all areas of behavior (Gillespie & Seibel, 2006).

Temperament, present from birth, also plays an important role in self-regulation. Temperament refers to individual styles of behavior, for example, how active children are, how easily they accept new things or adapt to changes, and their general mood. To build children’s self-regulation, adults recognize each infant or toddler’s individual temperament and adjust their responses to best fit each child’s temperament. Caring adults provide physical contact, sensitive social stimulation, and responsiveness needed to foster early self-regulation (Bronson, 2000).

Infants and toddlers who receive sensitive and responsive care from adults develop secure attachments, and are better able to control and effectively express emotions (Cassidy, 2008; Thompson, 1998). Support from caregivers is important to help infants regulate feelings of distress (Kiel & Kalomiris, 2015). When adults help infants and toddlers build empathy by talking about the emotions of others, children are more likely to behave in prosocial ways (Brownell, 2014).

Self-regulation skills develop gradually. Infants and toddlers typically show early self-regulation skills during experiences that lead to a desired goal or a desired activity (Thompson, 2001). In order to fully develop self-regulation skills, toddlers must receive many opportunities to experience and to practice the skill with adults and with other children (Florez, 2011; Tanyel, 2009). As toddlers observe the emotional responses of others, they increase the variety of emotions for their responses to include guilt, embarrassment, pride, and shame (Thompson, 2001). It is crucial for adults to provide the physical contact, sensitive social stimulation, and responsiveness needed to foster early self-regulation (Tanyel, 2009).
Area 1: Social and Emotional Development

**Self-Regulation - Preschool (3 - 5 years)**

**Standard 1.2.PS** Children show increasing ability to regulate their behavior and express their emotions in appropriate ways.

**Rationale - Why is this important for a child?**

Young children learn to regulate behavior under the guidance of adults (Shonkoff & Phillips, 2000). Self-regulation is not an isolated skill. Children must interpret their experiences into information they can use to assist in regulating their thoughts, emotions, and behaviors. Children learn this skill by watching and responding to self-regulation by adults (Florez, 2011). Self-regulation is a two-fold skill. Children must learn to control their impulses and to stop themselves from doing something, and they must also learn to do something they may not want to do (Bodrova & Leong, 2005).

As children enter the preschool age, their increasing language skills allow them to have a greater impact on their immediate environment and to better understand when caregivers talk to them about controlling their emotions and behavior (Gross, 2015). The expression of emotion in young children is linked to what they like and want, as well as to what they do not like and do not want (Wellman & Wooley, 1990). As a result, they show increasing understanding of emotions and skills in regulating their emotions. Four year-old children tend to understand more about strategies they can use to regulate their emotions than do three year-olds. Four year-olds tend to use more effective strategies to control anger than three year-olds (Cole, Dennis, Smith-Simon, & Cohen, 2009).

Culture directly influences how emotions develop, and how children display emotions (Kitayama & Markus, 1994). During early childhood, children learn that everyone has emotions and they can learn how others feel by observing expressions or emotions of other children (Hyson, 2008). They also learn emotions occur in response to different situations and that emotions are expressed in different ways. While young children’s understanding of emotions is often restricted to ‘mad,’ ‘sad,’ or ‘glad,’ they gradually develop more understanding of emotions such as fear, surprise, and disappointment.

When adults provide responsive interactions with children, model appropriate responses, and provide feedback to children, children learn how and when to express emotions in socially appropriate ways (Burchinal et al., 2008; Hamre, Hatfield, Pianta, & Faiza, 2014; Thompson, 1991). Children also learn from adults how to show empathy and to display concern over the emotional expressions of other children. Young children are preferred as playmates when they recognize the emotions of others and show their own emotions in socially appropriate ways (Saarni, Mimme, & Campos, 1997).
Area 1: Social and Emotional Development

Relationships with Adults - Infant and Toddler (birth - 3 years)

Standard 1.3.IT Infants and toddlers relate positively with significant adults.

Rationale - Why is this important for a child?

During the first year of life, infants and toddlers can become attached to several consistent, responsive, and sensitive adults. Attachment is the strong, emotional bond formed between an infant or toddler and a nurturing, responsive adult (Carter, 2001). Research suggests secure attachments to an adult that matters to the infant or toddler, as demonstrated through love and respect, are related to the most favorable social and intellectual growth (Fuller, Gasko, & Anguiano, 2010; NAEYC, 2010; Howes & Smith, 1995). In new situations, or with new adults, infants prefer to be close to familiar adults, with whom they developed an attachment, sometimes seeking physical contact with them. Attachment helps infants regulate their emotions, learn to interact with objects and people in their environment, and become aware of themselves as people (Thompson, 1998; Vacca, 2001). “Children’s early relationships teach them who they are and what they can expect from the world; and their healthy brain development thrives on loving attachments and secure sense of belonging” (Baker & Manfredi-Petitt, 2004, p.56). An infant typically uses the secure attachment to familiar adults as a base to explore the environment while returning occasionally to re-establish physical or visual contact with the familiar person (Ainsworth, Blehar, Waters, & Wall, 1978; Vacca, 2001).

Infants and toddlers are less likely to form attachments when caregiver changes occur frequently (Raikes, 1993; Cryer, Hurwitz, & Wolery, 2001); for example, frequent classroom changes that may occur in child care settings. The loss of a particular caregiver with whom a child established a trusting relationship can affect the child's feelings of security and can also affect the development of intellectual and social skills (Howes, Hamilton, & Philipsen, 1998; Howes & Smith, 1995). This is due to lost valuable learning during the time between when one caregiver leaves and the adjustment to a new caregiver. When children have frequent adjustments, their energy is consumed with establishing security, rather than with exploration and learning (Cryer, Hurwitz, & Wolery, 2001).
Area 1: Social and Emotional Development

Relationships with Adults - Preschool (ages 3 - 5)

Standard 1.3.PS Children relate positively with significant adults.

Rationale - Why is this important for a child?

“Children who feel valued and have positive and caring relationships with their caregivers are able to acquire the skills and understanding they need to regulate their emotions and behavior” (Dunlap, Fox, Hemmeter, & Strain, 2004, p.3). Young children’s school success requires trusting relationships with familiar adults (Howes & Ritchie, 2002; Hyson, 2008). After developing close, affectionate relationships with their primary caregiver (parent, grandparent, foster parent, guardian), children can also develop close, affectionate relationships with other familiar, sensitive, and responsive adults who nurture and support them (De Schipper, Taevecchio, & Van IJzendoorn, 2008; Sroufe, Fox, & Pancake, 1983). These bonds, referred to as attachment, form the basis to develop shared social relationships with adults and with other children (Thompson, 1998). To feel psychologically safe and free from anxiety, children must feel safe and comfortable with the adults in their lives.

Shared (reciprocal) relationships are often demonstrated differently across cultures and families. Also, research suggests feelings are often expressed differently across cultures. Some cultures encourage independence in children, so these children, when playing independently, are not necessarily withdrawing from relationships (Wittmer, 2011).

Children with diverse needs, especially those with challenging behaviors, may need more support to develop positive relationships. Thus, adults can use different strategies to interact with a child and to build a positive relationship. “If relationships are primary, then each adult’s contribution, experience, and availability are valuable” (Brinamen & Page, 2012, p.43).
Area 1: Social and Emotional Development

**Relationships with Children - Infant and Toddler (birth - 3 years)**

**Standard 1.4.IT Infants and toddlers respond to and initiate interactions with other children.**

**Rationale - Why is this important for a child?**

Interactions between infants and children the same age during the first year are usually simple and brief. Infants often make eye contact with other children and typically show distress when they see the distress of another infant. Later, they typically exchange smiles and vocalizations with other infants. Toddlers, typically, will imitate another infant’s actions, and begin some shared play (Lamb, Bornstein, & Teti, 2002). However, most toddlers show very limited ability to take turns or to share materials.

Infants and toddlers learn to share and to communicate feelings and experiences from their immediate surroundings with family and community (CSEFEL). Children learn social interactions from their families and community, which they then incorporate into their behavior with others. A caring adult may support infants and toddlers in expressing feelings, demonstrating social interactions, and developing strategies for interacting with other children to communicate their interests, needs, and wants.

Toddler friendships usually develop with other children who engage in positive interactions with each other. However, as many as 50% of the peer interactions among toddlers involve conflicts and typically involve possession of objects (Coie & Dodge, 1998). In preventing another child from taking a toy, toddlers usually find verbal responses such as “NO!” more effective than physical resistance such as holding on to the toy. During the toddler years, physical aggression tends to decrease, but verbal aggression tends to increase (Coie & Dodge, 1998). Adults help children develop relationships with other children by providing supervised opportunities for infants and toddlers to interact in an environment with adequate space and materials to minimize conflicts (Eckerman & Peterman, 2004).
Rationale - Why is this important for a child?

Improvements in social skills and reduction in aggression are linked to increases in communication, perspective taking, memory skills, and self-regulation (Coie & Dodge, 1998). Young children engage in more positive behavior and social exchanges with friends than with non-friends (Gottman & Graziano, 1983). Children with the capacity to develop friendships initiate contact, sustain interactions, and resolve conflicts better than children who do not develop friendships (Gottman & Graziano, 1983). In contrast, poor relationships with other children predict later rejection by other children (Coie & Dodge, 1998). Poor relationships and rejection by other children are associated with later problems in school and life, including social isolation, aggression, loneliness, social dissatisfaction, and low self-worth (Hymel, Rubin, Rowden, & LeMare, 1990), as well as low academic performance, school avoidance, truancy, and delinquency (Ladd, 1990; Parker & Asher, 1987).

Children who experience positive learning experiences and healthy relationships in the first years of life show a decrease in physical aggression during the preschool years. However, verbal aggression tends to increase, at least until four years of age (Cairns, 1979). Children learn healthy relationship skills and caring behaviors through observing these behaviors in adults.

As early as the preschool years, same-gender play and preferences can be observed (Manaster & Jobe, 2012). Children who spend more time in same-gender playgroups tend to develop more gender-stereotypical behaviors.

Children with diverse abilities are likely to need support to start or to join in play. Some children may need pairing with more competent same-age children who serve as models of appropriate interactions.
Area 2: Physical Well-Being and Motor Development

Healthy and Safe Living - Infant and Toddler (birth - 3 years)

Standard 2.1.IT Infants and toddlers participate in healthy and safe living practices.

Rationale - Why is this important for a child?

Tremendous growth occurs in infancy and early childhood, and requires an adequate healthy, balanced diet of nutrient-dense beverages and foods (rich in nutrients for the number of calories contained). These beverages and foods provide nutrients required to maintain health. This means planning and providing meals that include fruits, vegetables, whole grains, low fat or fat-free milk and dairy products, nuts, beans, seeds, turkey, chicken, fish, and lean cuts of meats. These building blocks are needed for brain development, muscle development, and mind and body coordination. Infants and toddlers are also learning and practicing eating skills used throughout life. Infants first learn to swallow liquids and progress through handling a variety of textures and flavors. Adults can provide nutrient-dense food and beverages that meet the child’s current feeding skills and help her or him develop a curiosity for new foods. Caregivers should look for signs of food allergies as new foods are introduced, and maintain open communication with families. The Center for Disease Control reported an increase of 50% in food allergies between 1997 and 2011 (Jackson, Howle, & Akinbami, 2013).

Infants and toddlers need nutritious foods critical for growth and development. It is important to combine daily nutritious foods with appropriate daily physical activity and play time for healthy physical, social, and emotional development. Solid evidence exists that physical activity can prevent a rapid gain in weight, which leads to childhood obesity early in life. According to the Centers for Disease Control, childhood obesity more than doubled in children during the past 30 years. Although obesity among children aged 2 to 5 years decreased from 13.9% in 2003-2004 to 9.4% in 2013-2014, childhood obesity remains high, and is more common among certain populations. Children with obesity are more likely to become adults with obesity. Adult obesity is associated with the increased risk of a number of serious health conditions, including heart disease, Type 2 Diabetes, and cancer. Best practices in early care and education to reduce childhood obesity include promoting healthy eaters, providing healthy beverages, increasing physical activity, limiting screen time, and supporting breastfeeding. Infants and toddlers need active time, including tummy time, time outdoors, and engaging in activities. It is important to limit time in restrictive settings, such as car seats, bouncy seats, cribs, and swings.

Early feeding behaviors play an important role in establishing healthy food preferences and behaviors to prevent childhood overweight and obesity. Promoting healthy nutrition and feeding patterns for infants and toddlers from birth to 24 months, with an emphasis on dietary quality, portion sizes, and mealtime environment, is critical. Physical activity, soothing, and adequate sleep influence early feeding behaviors and weight outcomes (Feeding Guidelines for Infants and Toddlers, 2017).
Sudden Infant Death Syndrome (SIDS) and unintentional injuries are the leading causes of death for infants and toddlers. Drowning, burns, and suffocation from unsafe sleep environments are the most common death-related injuries. Serious injuries in this age group resulting in hospitalization are due to falls and poisoning (Iowa Department of Public Health, 2015). Because young exploring children lack the judgment to avoid dangerous situations, adults have the responsibility to provide active supervision, safe routines, and developmentally appropriate equipment, toys, and environments. Research shows rates of SIDS decline dramatically when infants are placed on their back to sleep. The American Academy of Pediatrics (AAP) recommendations create a safe sleep environment to reduce the risk of SIDS and suffocation, including placing the baby on his or her back on a firm mattress in a safety approved crib or portable crib with a tight-fitting sheet - no soft bedding, bumper pads, blankets, pillows or soft toys in the crib. A bare crib is best. Avoid over heating the baby, use sleep clothing or a wearable blanket, if needed. Do not use sleep positioners, wedges, or monitors. After breast-feeding is well established, offer a pacifier, but only with parent or guardian permission (AAP, 2016).

Lead is a neurotoxin (substance poisonous or destructive to nerve tissue), and exposure can affect overall health and well-being. Even at low levels of exposure, lead can cause reduction in a child’s intelligence quotient (IQ) and attention span, and can result in reading and learning disabilities, impaired hearing, impaired formation and function of blood cells, hyperactivity, and behavioral difficulties. These effects are not reversible after the damage is done, which affects a child’s ability to learn, to succeed in school, and to function later in life. Lead exposure to children most often occurs through chipping and peeling interior and exterior paint. Additional sources of lead exposure occur through environmental contamination, imported play equipment, toys, jewelry used for play, vinyl mini-blinds, food contact products, and drinking water (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2010; American Academy Of Pediatrics, American Public Health Association, and National Resource Center for Health and Safety in Child Care and Early Education, 2011, United States Environmental Protection Agency, 2017).

Routine well-child health screenings with a primary care provider are important for improved oral, physical, mental, and social and emotional health, and for preventative health care. It is important that each well-child screening visit includes a complete physical, growth, height, weight, vision and hearing assessment, nutrition/obesity prevention, oral health assessment, developmental assessment, anticipatory guidance, and immunizations following the recommended schedule. Routine dental checkups are also critical for preventative oral health care (Bright Futures, AAP).*

Area 2: Physical Well-Being and Motor Development

Healthy and Safe Living - Preschool (ages 3 - 5)

Standard 2.1.PS Children show increasing awareness of healthy and safe living practices.

Rationale - Why is this important for a child?

Healthy eating provides needed nourishment for children’s brains and for physical activities. Although children of this age may struggle to taste new foods, repeated exposure help them establish healthy food preferences (Cooke, 2007). Well-rested children are less distracted, have more acute attention spans, and have improved ability to control impulsive reactions (Galinsky, 2010). Best practices in the early care environment for reducing childhood obesity include nurturing healthy eaters, providing healthy beverages, increasing physical activity, and limiting screen time. Adults are important role models for healthy and safe living practices.

Burns, drowning, falls, and poisoning are the highest risk for injury and death for 3-5 year-olds. Appropriate levels of risk encourage exploration without undermining children’s safety. Even very young children can begin to learn about personal safety. Adults support safety by setting up age-appropriate environments with a variety of materials for play, exploration, and learning. It is important for adults to frequently check indoor and outdoor environments for safety and health hazards.

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Routine well-child health screenings with a primary care provider are important for improved oral, physical, mental, and social and emotional health, and for preventative health care. Families can expect each well-child screening visit to include a complete physical, growth, height, weight, vision and hearing assessment, nutrition/obesity prevention, oral health assessment, developmental assessment, anticipatory guidance, and immunizations following the recommended schedule. Routine dental checkups are also critical for preventative oral health care (Bright Futures, AAP).
Area 2: Physical Well-Being and Motor Development

Large Motor Development - Infant and Toddler (birth - 3 years)

Standard 2.2.IT Infants and toddlers develop large motor skills.

Rationale - Why is this important for a child?

Large motor development, such as crawling, walking, and running, includes skills that involve the big muscles of the body. Reaching for objects is also defined as ‘whole body activity’ because the movements require balance while reaching (Rochat & Goubet, 1995). Infants and toddlers move for exploration and fun. They use movement to get to people and toys. They typically make significant gains in balance, strength, coordination, and locomotion during the first 30 months. These advances in motor skills also affect intellectual, and social and emotional development. For example, although infants can distinguish between shallow and high drop-offs, they show no fear of heights until they can crawl on their own (Bertenthal & Campos, 1990). Complex motor skills such as learning to walk up a slope require the development of visual perception, physical strength, coordination, and balance gained through previous motor experiences (Adolph, 1997).

To help infants and toddlers develop large motor skills, adults should provide indoor and outdoor environments that are both safe and challenging to explore. It is important for adults to limit the use of restrictive equipment, such as bouncy and Bumbo seats, exersaucers, infant swings, and jumping equipment. These types of equipment limit movement and the proper development of large motor skills. Research reports that infants who spend time in restrictive equipment show delays in physical development (Garrett, McElroy, & Staines, 2002).

Active play and supervised structured physical activities promote healthy weight, movement skills, and overall fitness, including mental health, improved bone development, cardiovascular health, and development of social skills. Adults can provide opportunities for children to be physically active and to facilitate the child’s movement skills from the moment of birth. The National Association for Sports and Physical Education (NASPE) and the American Academy of Pediatrics (AAP) recommend engaging toddlers in a minimum of 60 minutes of physical activity daily and not to remain sedentary for more than 60 minutes at a time - this excludes times of sleeping (NASPE, 2002).

The National Resource Center for Health and Safety in Child Care and Early Education (NRC) emphasizes that physical activity promotes gross motor development and provides health benefits including improved fitness and cardiovascular health, healthy bone development, improved sleep, and improved mood and sense of well-being. Physical activity habits learned early in life may track into adolescence and adulthood supporting the importance for children to learn lifelong healthy physical activity habits (NRC, 2017).
Area 2: Physical Well-Being and Motor Development

Large Motor Development - Preschool (3 - 5 years)

Standard 2.2.PS Children develop large motor skills.

Rationale - Why is this important for a child?

Development of large motor skills, such as running, jumping, throwing, catching, balancing, and climbing, is influenced by maturing, environment, and the individual child’s experiences (Haywood & Getchell, 2009). While young children learn motor skills, they typically show a variety of ways of performing the skill. With experience, children gain ability to perform skills more consistently. By five years of age, children show more integrated skills, such as the use of arms to help them jump or a shift in weight to help them throw. Children develop physical fitness, for example, strength, flexibility, and endurance. Children develop motor skills from a variety of child-initiated and adult-directed experiences. Physical activity patterns follow children into adulthood. Inactive health-risk behaviors are more difficult to change as children age and it is important to encourage enjoyable activities throughout the preschool years (Goodway, Getchell, & Raynes, 2009).

Research links daily physical activity to health at all ages (U.S. Department of Health and Human Services, 1996). Studies also show even though children engage in active play on the playground, the intensity and duration of their movement may not be sufficient to ensure health, fitness, and motor development (Timmons, Naylor, & Pfeiffer, 2007). This suggests children need adults to provide some structured physical activities that promote the desire to continue participating in fun movement activities as they get older. For preschoolers, researchers suggest at least 30 minutes per day of structured, adult-guided motor activity to keep children moving (Trawick-Smith, 2010), while the National Association for Sport and Physical Education recommends 60 minutes per day (Goodway, Getchell, & Raynes, 2009).

It is important for children to play actively several times each day. Their activity may happen in short bursts of time and not all at once. Physical activities for young children should be developmentally appropriate, fun, and offer variety. Younger children usually strengthen their muscles when they do gymnastics, play outside, or climb on playground structures. Also, the skill and coordination needed for complex physical activities may not allow for younger children to participate safely (National Resource Center for Health and Safety in Child Care and Early Education, 2017). However, teaching or expecting these skills to develop before children are developmentally ready is more likely to cause frustration than long-term success in organized sports (Stryer, Toffler, & Lapchick, 1998). It is important for caregivers to provide developmentally appropriate games and activities for children and to offer plenty of opportunities to practice, to make mistakes, and to receive positive feedback when trying new things.
Area 2: Physical Well-Being and Motor Development

Small Motor Development - Infant and Toddler (birth - 3 years)

Standard 2.3.IT Infants and toddlers develop small motor skills.

Rationale - Why is this important for a child?

Small motor development includes skills related to the muscles in our fingers and hands, such as picking up and holding objects. With the development of small motor skills, the infant gains self-help skills, including eating and picking up toys. Small motor skills affect the development of self, reasoning, and social skills (Smitsman, 2004). After learning to reach, grasp, and pick up an object, an infant can use the object to learn its properties, such as whether it is hard, soft, sweet, or cold. When an infant learns to bring her or his hands together, the infant can take part in social activities such as clapping. These games, in turn, promote additional adult-infant interactions. Large motor and small motor development depend on maturing, development of visual perception skills, and a variety of experiences to affect the development of small motor skills (Smitsman, 2004). As infants and toddlers practice small motor skills, they build the necessary movements for early writing experiences.
Area 2: Physical Well-Being and Motor Development

Small Motor Development - Preschool (ages 3 - 5)

Standard 2.3.PS Children develop small motor skills.

Rationale - Why is this important for a child?

Small motor skills require a child to handle and work with objects using accurate, controlled, and precise movements. With practice, children also become skilled in self-care skills, including buttoning, snapping, and zipping. By manipulating small objects, such as stringing beads, young children gain small muscle control to perform more complex tasks (Case-Smith & Pehoski, 1992). With experience, young children gain skills to use tools to eat, draw, and paint (Henderson & Pehoski, 1995). Early scribbles become letter-like forms as children watch caregivers write (Iowa Department of Education, 2001). These skills provide the basis for handwriting and other small motor skills needed for success in daily life and in school. Adults can support development of small motor skills by providing a variety of age-appropriate materials and many opportunities for play and exploration.
Area 3: Approaches to Learning

Curiosity and Initiative - Infant and Toddler (birth - 3 years)

Standard 3.1.IT Infants and toddlers express curiosity and initiative in exploring the environment and learning new skills.

Rationale - Why is this important for a child?

Infants and toddlers are naturally motivated to explore the world around them. They investigate and engage with objects and people in their environment, and gather knowledge in the process. Even the youngest children make active choices and decisions (Lockhart, 2011). As part of exploring, infants typically put anything into their mouths. After repeated exposure to the same toys, infants and toddlers typically explore new ways to use these materials (Piaget, 1952). Toddlers may explore objects vigorously, occasionally breaking objects.

An infant gains interest to explore objects through experiences that are different from experiences that lead to exploring people (Wachs & Combs, 1995). Infants who spend a lot of time with caring adults who name, show, and demonstrate objects typically spend more time playing with adults and objects together. However, these infants spend less time exploring objects on their own. In contrast, infants typically spend more time exploring objects in environments with lots of interesting objects to explore. To build curiosity, interest, and initiative to explore new experiences by an infant or toddler, adults should regularly observe children. This information guides the adult to provide infants and toddlers with space, time, and materials to explore, as well as opportunities to play jointly with adults and objects.
Area 3: Approaches to Learning

Curiosity and Initiative - Preschool (3 - 5 years)

Standard 3.1.PS Children express curiosity, interest, and initiative in exploring the environment, engaging in experiences, and in learning new skills.

Rationale - Why is this important for a child?

The internal conflict of initiative versus guilt is central to the preschool years (Erikson, 1950). Initiative - trying new and familiar skills - is a key part of the development of competence. When a child experiences many failures - especially those the child believes is his or her fault - the child is less likely to try new experiences and to learn new skills. Children who hesitate and avoid new experiences often experienced repeated failures (Smiley & Dweck, 1994). Children are more likely to initiate and to explore activities when they see the results depend on their actions (Bandura, 1997). Caring adults influence this development by providing a variety of materials for play and exploration that encourage children to try new experiences at which they are likely, with effort, to be successful (Kopp, 1991). Children are more likely to repeat experiences when adults give encouragement and feedback that links their effort to results (Skinner, 1995). Caring adults can help children learn how to think in concepts and to remember new information by answering the “why” questions about the way the world works (Siegler, DeLoache, & Eisenberg, 2006). There is always a sociocultural (combining social and cultural) component to the development and expression of imagination, which is an important element of curiosity and initiative (Eckhoff & Urbach, 2008).
### Area 3: Approaches to Learning

#### Engagement and Persistence - Infant and Toddler (birth - 3 years)

**Standard 3.2.IT** Infants and toddlers purposefully choose, engage, and persist in play, experiences, and routines.

### Rationale - Why is this important for a child?

Learning occurs when children can handle and choose materials, and can freely use their entire bodies and all their senses (Lockhart, 2011). Infants and toddlers usually show pleasure when they are successful at manipulating their environment and at overcoming barriers to reach a goal. Infants and toddlers are motivated to explore their surroundings, to overcome obstacles, and to master their environment (White, 1959). Early persistence by infants and teaching by adults predict intellectual abilities of children at 14 months (Banerjee & Tamis-LeMonda, 2007).

Toddlers differ in their interest in engaging and persisting in activities as a result of differences in personality and in the styles of caregiving they receive (Stipek & Greene, 2001). Toddlers show more persistence in activities when caregivers promptly respond to requests for help (Lutkenhaus, 1984). Adults foster engagement and persistence by providing enough interesting materials for young children to use, and time for them to explore the materials as long as they are interested. Adults may need to provide physical adaptations to enable each child to engage and to persist in the exploration of materials.
Area 3: Approaches to Learning

Engagement and Persistence - Preschool (3 - 5 years)

Standard 3.2.PS Children purposefully choose and persist in experiences and play.

Rationale - Why is this important for a child?

Children who believe success depends on their efforts and that they are capable of success are more likely to be persistent (Bandura, 1997). Young children who are given some independence are more likely to complete tasks (Grolnick, Frodi, & Bridges, 1984). The ability to focus attention and to concentrate increases academic learning, including acquiring language skills and problem solving, as well as social skills and cooperation (Bono & Stifter, 2003; Landry, Smith, Swank, & Miller-Loncar, 2003; Murphy, Laurie-Rose, Brinkman, & McNamara, 2007). There is a very rapid increase in impulse control during the preschool years (Jones, Rothbart, & Posner, 2003). Play provides an appropriate setting for learning about active involvement, to persist, and to take risks. When children participate with adults in playful learning activity, children learn and develop thinking abilities (Siraj-Blacksford, 2009).

Caring adults encourage persistence by guiding children to tasks where their efforts are likely to bring success. Adults give only the minimum help necessary to complete a task. They give specific feedback to children that success is due to efforts (Skinner, 1995). Offering a variety of planned play experiences supports each child’s most favorable physical, mental, emotional, and social development.
Area 3: Approaches to Learning

**Reasoning and Problem Solving - Infant and Toddler (birth - 3 years)**

Standard 3.3.IT Infants and toddlers purposefully demonstrate strategies for reasoning and problem solving.

Rationale - Why is this important for a child?

Infants show the beginning of problem solving when they use a series of actions to reach a goal, such as pulling a string to reach an attached toy (Piaget, 1952; Lockman, 2002). Infants will imitate problem-solving behaviors shown by others if the behaviors are within their abilities (Meltzoff, 1988). Toddlers deliberately vary their actions, observing the effects of each change in trial and error. Through active experimentation with materials, infants and toddlers think through trial and error solutions with similar materials (Uzgiris & Hunt, 1975).

Caring adults help young children develop reasoning and problem solving skills by making problem solving opportunities available as children explore a wide variety of materials. Caring adults can encourage infants and toddlers to experiment to find solutions by not intervening too quickly to solve problems for them. Caring adults can help infants and toddlers notice the results of their experiments (Piaget, 1980). During problem solving opportunities, adults talk through solutions and display appropriate behavior.
Area 3: Approaches to Learning

Reasoning and Problem Solving - Preschool (3 - 5 years)

Standard 3.3.PS Children demonstrate strategies for reasoning and problem solving.

Rationale - Why is this important for a child?

Problem solving is natural for young children, because so much of the world is new. Problem solving is learned through daily routines and play experiences involving issues important to the child. Allowing children the freedom to explore and to play promotes skills needed to reason and to solve problems (Bruner, 1973; Lockman, 2002). At the same time, children who repeatedly experience failure and criticism are less likely to attempt new problems (Smiley & Dweck, 1994). “Playful, negotiatory, flexible, mindful interaction early on may become a model later for what you do when you encounter problems” (Bruner, 1985, p.905). Through active experimentation with materials, children use trial and error to think through solutions.

Caring adults help young children develop reasoning and problem solving skills by using problem solving opportunities while children explore and play with a wide variety of materials, and by not intervening too quickly to solve problems for them (Piaget, 1980). During problem solving opportunities, adults can enhance problem-solving skills for preschoolers by giving hints, talking through possible solutions, and by displaying appropriate behaviors (Joh et al., 2010; Bascandziev & Harris, 2010).
Area 3: Approaches to Learning

Play and Senses - Infant and Toddler (birth - 3 years)

Standard 3.4.IT Infants and toddlers engage in play to learn.

Rationale - Why is this important for a child?

Play is fundamental and essential for infants and toddlers to develop healthy active brains, bodies, and relationships (Ginsberg, 2007). Children learn about themselves and the world through self-created experiences, play, and positive social interactions with other children and with nurturing adults. For infants, play is voluntary and self-motivating (Young & Hauser-Cram, 2006). Through play, infants and toddlers typically build understanding and skills in intellectual, communication, motor, social, and emotional development. Piaget (1971) argued that play allows infants and toddlers to build understanding of how things work; including their own bodies, and allows them to test their understandings. Infants and toddlers who are allowed to spend most of the day freely moving arms and legs, while exploring their physical environment designed for maximum safety, develop the most advanced motor and cognitive skills needed for later development. Given time, space, supportive adults, open-ended materials, and safe, yet challenging environments, children develop confidence in themselves. They develop capabilities to master their environment. They develop deep-rooted connectedness to others and caring about others. They develop the ability to create and to spread environments of love, safety, security, and resilience (Ginsberg, 2007).
Area 3: Approaches to Learning

Play and Senses - Preschool (3 - 5 years)

Standard 3.4.PS Children engage in play to learn.

Rationale - Why is this important for a child?

Play is so important for the most favorable child development that it is included as a right of every child in the United Nations High Commission for Human Rights (Convention on the Rights of the Child, General Assembly Resolution 50/155 of 21, 1995). Research confirms and continues to explore and support the core value and positive benefits of play as a positive approach to learning for young children (Hyson, n.d.; Lifter, Foster-Sanda, Arzamarski, Briesch, & McClure, 2011). The most recent position statement on Developmentally Appropriate Practice in Early Childhood Programs Serving Children Birth through 8 (NAEYC, 2009) describes the basic and long-term benefits of play that include the development of self-regulation skills, as well as language, intellectual, and social competence.

Research shows a relationship between play in the natural environment and the positive impact on social-emotional development (Weinstein, Przybylski, & Ryan, 2009), motor development (Fjørtoft, 2001), and intellectual development (Wells & Evans, 2003). Outdoor play also boosts exercise levels that help children reduce body fat (Moore, Gao, Bradlee, Cupples, Sundarajan-Ramamurti, Proctor, & Ellison, 2003). Outdoor play can help children maintain healthy weight, build stronger muscles and bones, and reduce blood and cholesterol levels. A recommended daily dose of at least one hour of outdoor play helps young children achieve healthy fitness levels (NASPE, 2003).
Area 4: Social Studies

Awareness of Family and Community - Infant and Toddler (birth - 3 years)

Standard 4.1.IT Infants and toddlers demonstrate a sense of belonging within their family, program, and other social settings or groups.

Rationale - Why is this important for a child?

Infants and toddlers who have warm, nurturing relationships with parents/guardians and other adults develop better social skills than those with poor relationships. For very young children, acceptance, emotional attachment, and ongoing nurturing are the most important basis for building a sense of belonging. The way caring adults relate to an infant or toddler influences her or his feelings of safety, security, and belonging within various settings. Predictable routines help infants and toddlers adjust to settings, which builds the sense of belonging. Caring adults who nurture and respond to children’s needs help infants and toddlers feel their needs are important and valued, which in turn creates a sense of belonging (Stratigos, Bradley, & Sumsion, 2014; Woodhead & Booker, 2008; De Schipper, Tavecchio, & Van IJzendoorn, 2008; Dykas & Cassidy, 2011, Edwards & Raikes, 2002).
Area 4: Social Studies

**Awareness of Family and Community - Preschool (3 - 5 years)**

**Standard 4.1.PS** Children demonstrate an increasing awareness of belonging to a family and community.

**Rationale - Why is this important for a child?**

Membership in a family contributes to a child’s identity, which sets the stage for his or her confidence in interacting with others.

Successful participation by a child in a group involves confidence in expressing her or his own ideas and opinions, while respecting ideas and opinions of others. Successful participation develops empathy and cooperation, group problem solving, group decision-making, and valuing ideas such as fairness and individual rights (Cooper, 1980; DeVries & Zan, 1994; Marcus, Teller, & Roke, 1979; Parsons, Young, Murray, Stein, & Kringelbach, 2010).
Area 4: Social Studies

Awareness of Culture - Infant and Toddler (birth - 3 years)

Standard 4.2.IT Infants and toddlers demonstrate a strong sense of self within their culture.

Rationale - Why is this important for a child?

Culture is “a set of values, beliefs, and ways of thinking about the world that influences everyday behavior” (Trumbull, Rothstein-Fisch, Zepeda, & Gonzalez-Mena, 2005, p.3). “Culture is transmitted from one generation to the next in multiple ways, both explicitly - in conversations and direct guidance - and implicitly - in daily practices such as child-rearing” (Trumbull, Rothstein-Fisch, Zepeda, & Gonzalez-Mena, 2005, p.3).

Infants and toddlers develop a sense of culture at a very young age. Infants and toddlers become aware of cultural surroundings through the language they hear, and how family and adults behave around them in caregiving. They become aware through interaction with others, expectations about learning and abilities, and through important stories and traditions. “Through culture, children gain a sense of who they are, a feeling of belonging, what is important, what is right and wrong, how to care for themselves and others, and what to celebrate, eat, and wear” (Mangione, 1995, p.ix). Providing consistent connections (continuity) between home and early care and education environments is essential. The process of adopting the cultural traits or social patterns of another group occurs, even while exposure to differences is certain and healthy (Day & Parlakian, 2004; Maschinot, 2008; Quintana, Aboud, Chao, Conteras-Grau, Cross, Hudley, & Vietze, 2006; Rothstein-Fisch, Greenfield, Trumbull, Keller, & Quiroz, 2010).
Area 4: Social Studies

Awareness of Culture - Preschool (3 - 5 years)

**Standard 4.2.PS** Children demonstrate an increasing awareness of culture and diversity.

**Rationale - Why is this important for a child?**

Culture is “a set of values, beliefs, and ways of thinking about the world that influences everyday behavior” (Trumbull, Rothstein-Fisch, Zepeda, & Gonzalez-Mena, 2005, p.3). Every individual is rooted in culture, and culture influences every aspect of human development. Culture is learned through repeated, daily interactions children have with the people around them. Children gain cultural knowledge as they develop language, learn concepts, and experience caring relationships from parents and guardians, family members, teachers, and other people around them (Office of Head Start, 2008; Office of Head Start, 2015).

The population of Iowa and the United States is growing increasingly diverse, with the fastest and most diverse growth among children (Child and Family Policy Center, 2012). This diversity includes a variety of cultures, languages, races, religions, abilities, and family structures (Konishi, 2007). Young children in the United States are “not only oriented by their own multiple cultures, such as race, ethnicity, age, gender, and family, but also by living and learning within a socioculturally [combination or interaction of social and cultural elements] conditioned world filled with many different conditions of cultural difference” (Hyun, 2007, p. 262). Children in such a diverse world feel differently in different places, see things from different perspectives, interact with others in different ways, and listen to different languages patterns as they grow up (Hyun, 2007).
Area 4: Social Studies

Exploration of the Environment - Infant and Toddler (birth - 3 years)

Standard 4.3.IT Infants and toddlers explore new environments with interest and recognize familiar places.

Rationale - Why is this important for a child?

Self-directed exploration and play depends on functioning senses and motor skill development. It is also dependent on a child’s comfort and security as well as her or his ability to acquire information through all five senses. Infants and toddlers who are comfortable and secure are more likely to explore new places and to take risks. Infants and toddlers who are allowed to spend most of the day freely moving their arms and legs, as they explore and play within a physical environment planned for maximum safety, develop the most advanced motor and mental skills needed for later development. Exploration increases the richness of experiences and promotes brain development by providing more and varied stimulation (Bowlby, 1988; Gallagher, 2005; Hopkins, Dore, & Lillard, 2015; Lillard, 2015; Paley, 2004; Woolley, & Lillard, 2015).
Area 4: Social Studies

**Awareness of the Relationship Between People and the Environment in Which They Live - Preschool (3 - 5 years)**

**Standard 4.3.PS** Children demonstrate an increasing awareness of the environment in which they live, especially how people (including themselves) relate to that environment.

**Rationale - Why is this important for a child?**

As children move in the world, they develop awareness of the environments where they live. Over time, these environments become familiar and new ones are explored. Young children need to think about their surroundings and how settings are different, such as how a library is different from a store. Thinking and forming concepts about environments are shaped by observations of the world around them, and how they move and interact within that world. These perceptions become memories and are used to form ideas about the world, including awareness of environmental issues (Cohen & Horm-Wingerd, 1993, DeLoache & Brown, 1983; Pyle, 2002). Just as relationships with adults and other children shape a child’s growth and development, so do relationships with their environment and the world around them.

Exploring different settings helps children learn about the roles people play, such as doctors, firefighters, or teachers. As children learn about these roles, they imitate them during play experiences. Caring adults can talk with children about the roles adults play and the value for communities. Adults can help children learn about roles and job responsibilities by creating opportunities for children to help.
Area 4: Social Studies

Awareness of Past - Preschool (3 - 5 years)

Standard 4.4.PS Children demonstrate an increasing awareness of past events and how those events relate to one’s self, family, and community.

Rationale - Why is this important for a child?

Children’s experiences shape, and even determine, what they learn. Experiences happen as a chain of events. As memory develops and thinking skills improve, children can reflect on past events and experiences and “re-experience” by feeling again the emotions from that event, retelling the stories of the event, and making connections between past events and what they are thinking and feeling at the moment (Bernier, Carlson, Deschênes, & Matte-Gagné, 2012).

Past events are what we call history, which includes the development of historical knowledge and the use of historical knowledge to make sense of the present. For young children, first explorations with historical knowledge begin with memories of personal experiences and sharing those memories through creative expression like drawing a picture, play-acting, or retelling a story (Ellis, Boyce, Belsky, Bakermans-Kranenburg, & Van IJzendoorn, 2011). The ability to reflect on the past and to make it usable for the future is an important part of learning and is essential for development, even survival. For example, a child may burn himself or herself on a stove and then recall the event to learn that the stove, when hot, is a source of pain.
Area 5: Creative Arts

Art - Infant and Toddler (birth - 3 years)

Standard 5.1.IT Infants and toddlers participate in a variety of sensory and art-related experiences.

Rationale - Why is this important for a child?

In the first year of life, art takes the form of sensory experiences. Infants use sight, taste, touch, and hearing to explore a variety of materials. There is a connection between these sensory experiences, such as looking in a mirror or shaking a rattle, that supports the development of creativity (Herr & Swim, 2002). In addition, handling a variety of play materials builds the small motor skills necessary for writing and art experiences.

Older infants and toddlers explore art through using tools, such as crayons or brushes; or through direct handling of materials using their hands to explore clay, playdough, or finger-paint. Through scribbling, infants and toddlers learn what writing materials can do. From repeated exposure to art materials, infants and toddlers gain control of their movements and begin to intentionally plan and direct their use of materials (Lowenfeld & Brittain, 1987). Art by infants and toddlers is affected by the development of small motor skills, understanding, and perception, as well as through experience with specific materials (Seefeldt, 2005). Caring adults help young children develop art skills by providing repeated opportunities to explore both new and familiar media such as dough, clay, crayons, and paint. Caring adults individualize plans to enable each child to acquire skills in manipulating art media. It is important to focus art experiences on a child’s explorations and creations, rather than completing adult-directed projects.
Area 5: Creative Arts

Art - Preschool (3 - 5 years)

Standard 5.1.PS Children participate in a variety of art and sensory-related experiences.

Rationale - Why is this important for a child?

Through repeated experiences, young children gain skills in using a variety of materials for art, such as drawing materials, clay or playdough, and paint. Young children move from scribbling to exploring the properties of the material used, and to more representative efforts (Kellogg, 1967). Through the arts, children learn to communicate ideas and experiences while they make choices, gain motor coordination, and explore the physical properties of materials (Althouse, Johnson, & Mitchell, 2003). As children work through plans to build a structure from blocks or to paint a picture, they build intellectual skills (Seefeldt, 1995). Caring adults can support the exploration of art and sensory materials through having a variety of materials available, as well as plenty of time for creation.

As children explore writing and drawing materials, their drawings start out simple, and may include scribbling, but move into complex pictures as children’s small motor skills and knowledge increase. A child’s development of small motor skills will influence his or her writing and drawing capabilities. In addition, exploring art and sensory materials can build scientific thinking and vocabulary as children experience the properties of various items and talk with adults about what they experience.
**Area 5: Creative Arts**

**Music, Rhythm, and Movement - Infant and Toddler (birth - 3 years)**

**Standard 5.2.IT** Infants and toddlers participate in a variety of rhythm, music, and movement experiences.

**Rationale - Why is this important for a child?**

Infants are sensitive to musical sounds and patterns, even before birth. Young infants move their bodies rhythmically to music and can respond to patterns in songs (Trehub, 2001). Simple rhythmic songs with repeated phrases and rhymes help infants and toddlers learn language patterns, including sound (phoneme) patterns (Lerner, 2010). Traditional baby games and rhymes help babies learn language and to have fun. Babies learn to anticipate through highlights and patterns (Bardige, 2009). Moving to music helps infants and toddlers develop large muscle control and dexterity (Weikart, 1998). Musical play comes naturally to children, encourages life skills, and offers opportunities for social interaction (Crowe, 2010). Adults help children develop skills in music and movement by providing daily and repeated opportunities to sing, to chant, and to move to new and familiar songs and music. Music engagement is central to the cultural practices and circumstances of many young children’s experiences (Barrett, 2011). Music is also a wonderful tool to help toddlers identify and to understand the emotions they experience, while learning to cope with and to control their worlds. This is done by easing transitions and recognizing patterns throughout the day (Pruett, 1999).
Area 5: Creative Arts

Music, Rhythm, and Movement - Preschool (3 - 5 years)

Standard 5.2.PS Children participate in a variety of music and movement experiences.

Rationale - Why is this important for a child?

A large body of research reveals that children learn in, and through, music. Musical activities such as singing, dancing, or rhythmic movement, and playing or listening to music promotes additional learning in a variety of areas, including reaching conclusions or explaining things because of an experience (Rauscher, Shaw, Levine, Wright, Dennis, & Newcomb, 1997). An important finding in recent brain research shows that music and music experiences help develop both sides of the brain and contribute to children’s social/emotional, physical, mental, and language development (Dodge, 2016). Music provides opportunities for children to connect with their home language and culture, as well as the multiple languages and cultures within their community. In addition, music is a tool to promote social-emotional development, including self-control (Scripp, 2002). Hearing playful songs and rhymes, including traditional songs and rhythms, develop lifelong sensitivity and imagination, as well as a sense of wonder and love of singing and dancing (Feierabend, 2006). Adults can support music and movement by providing a variety of experiences throughout each day using child-appropriate music and materials.
Area 5: Creative Arts

Dramatic Play - Infant and Toddler (birth - 3 years)

Standard 5.3.IT Infants and toddlers engage in dramatic play experiences.

Rationale - Why is this important for a child?

Most infants develop the ability to imitate what they see and then imitate what they recall. Some infants and toddlers prefer to use real-life props and objects in their play. Older infants and toddlers learn to let one object stand for another such as using a block on a plate to represent a piece of cake (Paley, 2004). Other infants and toddlers focus on objects, people, and events not present at that time, which results in fantasy play or make-believe. They also act out sequences of actions they observe, as well as new patterns they plan. Later, they may act out sequences of actions involving objects (Sluss, 2014). Occasionally, these play sequences involve other infants and toddlers. These actions help children develop motor, mental, social, emotional, and communication skills (Deiner, 2008). Adults support infants and toddlers in dramatic play experiences using a variety of props and by interacting within dramatic play experiences.
### Area 5: Creative Arts

#### Standard 5.3.PS Children engage in dramatic play experiences.

**Rationale - Why is this important for a child?**

Dramatic play, socio-dramatic play (the most advanced form of dramatic play where children carry out imitation and drama and fantasy play together; which involves role playing in which children imitate real-life people and their own personal experiences), symbolic play, and pretend play are varied terms that describe or refer to play that involves pretending or the use of symbols that represent something real. The importance of dramatic play to all areas of early development is well documented (Bodrova & Leong, 2005; Hughes, 2010). Its potential to address academic goals in school settings is also found in educational and professional literature (Barnett, Jung, Yarosz, Thomas, Hornbeck, Stechuk, & Burns, 2008; Bodrova, 2008). Some authors find a close relationship between various types of dramatic play and specific curricular areas for typically developing children and those with special needs (Bray & Cooper, 2007; Brown, Remine, Prescott, & Rickards, 2000; Burns, 2008; Kim, 2005; Oliver and Klugman, 2006).

Dramatic play (Howes, 1992) helps children learn to communicate, to control and compromise, and to explore intimacy and trust. In socio-dramatic play, children assume different roles from their experiences, and use their understandings to act out a variety of emotions and social relationships. Children who engage in dramatic play typically show more advanced skills in seeing the perspectives of others and in getting along with peers (Garvey, 1990).
Area 6: Communication, Language, and Literacy

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<tr>
<th>Language Understanding and Use - Infant and Toddler (birth - 3 years)</th>
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<tr>
<td>Standard 6.1.IT Infants and toddlers understand and use communication and language for a variety of purposes.</td>
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Rationale - Why is this important for a child?

Through interaction with caring and nurturing adults, infants and toddlers acquire both listening (receptive language) and speaking (expressive language) vocabulary. Young infants typically make sounds, take turns in ‘conversations’ with adults, and respond to adult spoken conversations (Hibrink, Gattis, & Levinson, 2015; Lock, 2004). Older infants use gestures, such as pointing or reaching up, as part of communication (Camaioni, 2004). Infants typically develop some listening vocabulary before their first birthday. Most infants move from one-word to two-word to three-word phrases while some toddlers begin talking in sentence-length phrases (Camaioni, 2004). Language use influences and is influenced by intellectual development (Shonkoff & Phillips, 2000). When adults talk to infants and toddlers during routine experiences such as diaper changing, dressing, or feeding, infants and toddlers develop larger vocabularies (Hoff-Ginsberg, 1991). Adults influence the types, use, and rate of learning language, especially when they focus on conversations within play experiences that interest the infant (Hart & Risley, 1995).

In recent years, an increase in the language, ethnic, and cultural diversity of infants and toddlers in Iowa early care and education programs occurred. Dual language acquisition - the development of skills and knowledge in two or more languages during the first five years of life - is not uncommon and is based on exposure to, and use of, two or more languages. The language developmental paths may differ from each child based on the variability of an infant’s and toddler’s experiences and exposure to various languages. However, early exposure, whether immediate or consecutive, can lead to the ability to speak two languages easily (Hammer et al., 2014; Hoff et al., 2014; Ramírez-Esparza, García-Sierra & Kuhl, 2017). Sometimes young children will mix up the two languages as they use them (called “code switching”). This is normal and not a sign of any difficulty in language development (Genesee, Paradis, & Crago, 2004).

Building relationships with families who come from non-dominant cultures or who use language other than English is a prerequisite to help programs support language development and results in better outcomes for children (Tabors, 2008). It is important for early learning programs to make a special effort to gather specific information about families, what languages are used and how often languages are spoken at home (PLA, n.d.). Adults need to understand the advantages of maintaining and using a child’s primary home language, as well as how infants and toddlers learn a second language. Use of a child’s home language supports infant and toddler development through building a sense of self within his or her family (Pearson & Mangione, 2006). Young children can learn two languages at the same time, although there are individual differences in the rate and manner of learning the languages.
It is important for adults to understand that communication patterns and expectations vary between cultures (Rogoff, Mistry, Goncu, & Mosier, 1993). Expectations for verbal versus non-verbal responses, and whether a child speaks before being spoken to are examples of cultural differences. Caring adults need to make decisions about communication based on the family’s beliefs, values, and practices in regard to child development and learning (Division of Early Childhood, 2004).

Adults must monitor and respond to signs of early hearing problems in infants and toddlers because hearing problems can limit language, mental, social, and emotional development. Children with any degree of hearing impairment benefit from early intervention services (Farran, 2000; Stika et al., 2015). Adults can use sign language and adaptive communication devices to support development of communication skills in children with hearing impairments and/or communication delays. Increasing family literacy involvement can benefit children’s intellectual and social emotional skills during the early childhood years (Baker, 2013).
Area 6: Communication, Language, and Literacy

Language Understanding and Use - Preschool (3 - 5 years)

Standard 6.1.PS Children understand and use communication and language for a variety of purposes.

Rationale - Why is this important for a child?

During the preschool years, children increase their understanding and use of sentences with greater length and sentence difficulty. They also increase in their ability to use language appropriately and effectively in a variety of social settings (Snow, Burns, & Griffin, 1998). Communication occurs both verbally and non-verbally. Although most children move from non-verbal to verbal communication, some children need non-verbal communication aids, such as sign language, picture communication systems, or communication devices. Vocabulary growth is rapid during the preschool years, but varies widely among children due to different cultural and financial backgrounds (Hart & Risley, 1995). For this reason, programs must intentionally expose children to a wide variety of experiences, and then supplement those experiences by describing them using a rich vocabulary (Wright & Neuman, 2015).

Oral language is especially important as a foundation for future reading because it serves as the main basis for learning words and how to put words together to make meaning in expressive and open communication (NELP 2008, Schickedanz & Collins, 2013; Whitehurst & Lonigan, 1998). Though often verbal, most children ages three to five still learn how language works and the rules surrounding it. It is important to provide obvious opportunities that support oral language through regular, deep, and broad conversations (Massey, 2004). Development of reading skills also builds oral language skills, such as teaching young children phonics and use of the alphabet (26 letters represent 44 sounds in the English language), sharing books, and use of technology to support learning (NELP, 2008).

Equally important is the development of background knowledge. Background knowledge is information children know, based on their everyday experiences, what people tell them about what is happening, in response to their questions. Children learn by connecting what they learn to something they already know, so a rich knowledge base is an important basis for reading comprehension and most other learning (Duke, Halvorsen, & Knight, 2012; Pinkham, Kaefer, & Neuman, 2012).

Recent trends in population change show a dramatic increase in race, ethnicity and language among children (Banerjee & Luckner, 2014; Krogstad, 2016). This presents both a challenge and an opportunity for early childhood programs. Many preschool settings are structured to operate according to a well-established school culture. Children in these settings, who are from different race, ethnicity, and language backgrounds, may experience cultural conflicts because of their different ways of learning and communication.
For young children, the language of the home is the language they use to make and establish meaningful relationships (Chang, 1993). The ongoing support and development of the home language serves as a foundation for learning English. Maintaining a child’s home language allows children to stay deeply connected to their families, as well as builds skills to use more than one language (Bialystok, 2001; DeBruin-Parecki & Slutzky, 2016; Paradis, Genesee, & Crago, 2011). Supporting home language is actually useful to help learn English and to support other academic skills (Burchinal, Field, López, Howes, & Pianta, 2012).

A child’s ability to learn increases when an adult supports the child’s use of home language. Learning a second language is sometimes difficult and people progress at different rates in learning both first and second languages. Children need opportunities to verbalize awareness of language differences and to understand the value of all languages. Learning through shared experiences helps children become more competent learners as they use more than one language, including their culture (California Department of Education, 2009; Guiterrez, Bien, Selland, & Pierce, 2011).
Area 6: Communication, Language, and Literacy

Early Literacy - Infant and Toddler (birth - 3 years)

Standard 6.2.IT Infants and toddlers engage in early reading experiences.

Rationale - Why is this important for a child?

The benefits to infants and toddlers from shared book experiences include increased communication, vocabulary, and other early literacy skills (Bus, Belsky, van Ijzendoorn, & Crnic, 1995; Murray & Egan, 2014). The American Academy of Pediatrics (AAP) considers early reading experiences so important that it recommends pediatricians to ‘prescribe’ reading for children (AAP, 2014). Shared book experiences are important for infants and toddlers to develop book knowledge, such as holding and turning pages of board books; and because earlier experiences are more likely to have effective results (NELP, 2008). Book reading is also connected with early awareness of sounds and rhymes. Exposure to nursery rhymes, rhyming songs, and word games influences the development of phonemes (sound) awareness and eventual reading skills (Bryant, MacLean, Bradley, & Crossland, 1990).

Responsive and caring adults who talk with toddlers about events and objects not present at the time (decontextualized language) also help build children’s later reading skills (Dickinson & Tabors, 2001). When adults create opportunities for joint attention and interaction while they read, they increase opportunities for children to talk. Research shows that intervening earlier - before the age of three - rather than later, is beneficial for promoting language development (NELP, 2008). Talking builds a toddler’s interested and animated vocabulary, which is an important prerequisite for later reading skills (Farrant & Zubrick, 2011; Whitehurst & Lonigan, 1998). Recent research shows it matters how adults read with infants and toddlers, and not just that they do, showing the effectiveness of reading styles that include warm interactions, responsiveness to children, frequent conversations, and referring to print while reading (Farrant & Zubrick, 2011; Sim et al., 2014).
Area 6: Communication, Language, and Literacy

Early Literacy - Preschool (3 - 5 years)

Standard 6.2.PS Children engage in early reading experiences.

Rationale - Why is this important for a child?

Early (emergent) literacy skills build on a child’s understanding and use of language. Language skills are linked to the development of reading, especially comprehension (Cain, 2015; Catts et al., 2002; Neuman & Dickinson, 2001). Adults who talk with children about current and past events, people, and objects, help children build their language skills. Conversations that analyze a story, with back-and-forth exchanges between adults and children during book reading, also help children increase their vocabulary, oral language skills, and print knowledge (Dickinson and Sprague, 2001; NELP, 2008). When a child participates in conversation during storytelling, and is coached to become the storyteller and to link the story to the child’s life, it appears to increase the child’s vocabulary (NELP, 2008). There is an equal effect at work: shared reading boosts oral language and vocabulary, and stronger oral language skills predict later reading skill.

Additional predictors of early reading include alphabet knowledge, phonological (speech patterns and pronunciation) awareness, and writing growth (NELP, 2008; Whitehurst & Lonigan 2001). Children able to name ten or more letters are generally not at risk of later reading difficulties (Piasta, Petscher, & Justice, 2012). Phonological processing involves the sensitivity to, manipulation of, and use of sounds in words, and requires understanding of the sounds of language. Phonological awareness includes recognizing and producing rhymes, breaking words into syllables, and identifying words with the same beginning, middle, or ending sounds. Phonological awareness skills in preschool children often predict success in early reading skills (Cunningham, 1990; Whitehurst & Lonigan, 2001) especially with alphabet knowledge (Suortti & Lipponen, 2016). Listening to stories builds phonological awareness, listening skills, vocabulary, and comprehension (Jacobs & Crowley, 2007). Adults can naturally build awareness within children throughout the day during reading activities, telling stories, playing word games, and using rhymes and riddles (Morrow, 2014).
Area 6: Communication, Language, and Literacy

Early Writing - Infant and Toddler (birth - 3 years)

Standard 6.3.IT Infants and toddlers engage in early writing experiences.

Rationale - Why is this important for a child?

Infants and toddlers develop skills in using writing instruments, such as markers and crayons, as they manipulate and explore a variety of materials during play and routine experiences. In addition, caring adults help older infants and toddlers develop writing skills by providing opportunities to use markers, crayons, and paintbrushes in appropriate ways and with the grip most comfortable to the children. Children will use a variety of grasps as their small motor skills mature, starting first with a fist grasp while moving the whole arm and hand (Carlson & Cunningham, 1990). They will use writing materials in a variety of ways and their writing skills reflect their development in reasoning and understanding (Dyson, 2001). As toddlers move between scribbling and drawing, the markings may only have meaning to the children (Whitehurst & Lonigan, 2001), but the movement from scribbles to controlled markings to drawings and then to symbols (not all of which will occur before age 3) is clearly documented sequence in research (Trivette, Hamby, Dunst, & Gorman, 2013). It is important for adults to model writing behaviors to encourage children to imitate the behaviors (Hernik & Csibra, 2015; McCarty, Clifton, & Collard, 2001).
Area 6: Communication, Language, and Literacy

Early Writing - Preschool (3 - 5 years)

Standard 6.3.PS Children engage in early writing experiences.

Rationale - Why is this important for a child?

Learning to read and learning to write are similar and equally strengthening processes (Fitzgerald & Shanahan, 2000). Teachers need to emphasize both to promote early literacy. Early writing is a strong predictor of later reading (NELP, 2008). A child’s attempt to write using scribbling, drawing, and pictographs often have meaning only to the child. Children may also use letters, numbers, and letter-like forms in their writing attempts (Puranik & Lonigan, 2011; Schickedanz & Collins, 2013). Children progress through several stages of writing and utensil grips as they practice skills (Carlson & Cunningham, 1990).

An understanding of the developmental order of writing is helpful to know how to support children on their journey to become writers. Support begins by encouraging and supporting early writing experiences (Cabell, Tortorelli, & Gerde, 2013). It is important to understand early efforts may not appear much like conventional writing. Young children may confuse writing and drawing. They may use characteristics of an object in early writing efforts, for example, the word *horse* may be bigger than the word *dog*. Young children may also use letters to represent syllables. The use of invented spellings, in which the child may use unusual symbols, such as the first and last sounds to represent a word: BT for boat. Invented spellings are strongly related to reading and spelling skills in the early grades (Whitehurst & Lonigan, 2001).

Probably the first word a child writes is her or his name. Caring adults must make a special effort to support the child in accomplishing this task because it suggests the gaining of a number of key literacy skills (Haney, 2002). As children begin writing, they build an understanding the written word is made up of sounds that carry meaning (Jacobs & Crowley, 2007). Because children’s extensive use of writing materials, prompted by adults, promotes development of writing and literacy skills, adults must provide children with the materials and opportunities to participate in writing activities (Trivette, Hamby, Dunst, & Gorman, 2013). As adults talk about letter sounds and draw attention to print in the classroom and outdoor setting, children build their phonological awareness (awareness of the sound structure of words, such as syllables) and early reading skills. Adults also support writing by helping children develop and refine fine motor skills by letting them practice finger dexterity, hand-eye coordination, and the grasping with the finger and thumb [pincer grasp] (Grissmer et al., 2010). Grissmer also found that fine motor skills, along with reading and other factors that may vary, were better forecasters of later academic learning than factors that may vary without fine motor skills. A final and key inspiration for children’s writing is imitating the writing they see adults do. It is important for adults to model writing behaviors to encourage children to imitate the actions in their writing experiences (Gerde, Bingham, & Wasik, 2012).
Mathematics Processes for Infants and Toddlers

The National Council of Teachers of Mathematics (NCTM) stresses the importance of children learning not only math content, but also math processes. According to NCTM, mathematical processes include problem solving, reasoning, communication, connections, and representations. It may not seem infants and toddlers are capable of these actions, however, adults can provide many opportunities in daily experiences to lay the foundation for these processes. More advanced mathematical skills are based on an early math ‘foundation’ - just like a house built on a strong foundation. Of particular importance for infants and toddlers are the processes of making connections and representations; and problem solving.

For infants and toddlers, representation involves making mathematical ideas ‘real’ by using words, pictures, symbols and objects, such as blocks. It is closely related to connections and communication as adults may talk about pretend play and real situations in mathematical terms. For example, during a pretend picnic, the adult can say “Here are two plates, and two cups, and two forks. Now we have enough for both of us to have a picnic.”

Infant and Toddler Standard 2.3 - Reasoning and Problem Solving states that Infants and toddlers demonstrate strategies for reasoning and problem solving. While not limited to mathematical thinking, these skills, reflecting a child’s Approaches to Learning, will help form an important early math foundation. See Area 2 - Approaches to Learning for rationale, benchmarks, and ways for adults to support learning in mathematics.

Mathematics Processes for Preschoolers

For preschoolers, the National Council of Teachers of Mathematics (NCTM) also stresses the importance of learning not only math content, but also math processes. The NCTM Standards (2000, p.7) explain that mathematics content and processes are “inextricably linked” and the processes are “vehicles for children to deepen, extend, elaborate, and refine their thinking” in order to “explore ideas and lines of reasoning” (NRC 2009, 42). In their joint position statement, NCTM and the National Association for the Education of Young Children (NAEYC), stress that high quality mathematics instruction will strengthen children’s skills in all of the mathematical processing areas (NAEYC & NCTM 2002, 3). In order for children to really ‘learn’ mathematics, they must use these processes to understand mathematical concepts.

According to NCTM, mathematical processes include problem solving, reasoning, communication, connections, and representations. The following definitions of these processes will help adults recognize when and how to incorporate the processes into mathematical learning opportunities.
Problem solving involves children identifying and understanding a problem, making a plan to solve it, carrying out the plan, and reviewing the results. A problem is a question that prompts someone to find a solution. Children show great differences in their ‘dispositions’ towards problem solving and benefit from opportunities to strengthen dispositions such as perseverance (grit), attention to task, risk taking behaviors, flexibility, and self-regulation.

Reasoning involves thinking through a question or a problem in order to arrive at an answer. Children who demonstrate reasoning are able to think logically, reflect on, explain, and justify their thinking. In order to developing reasoning skills, adults must listen to children’s reasoning in order to understand and then to encourage more sophisticated reasoning.

Communication involves the sharing of thoughts, ideas, and feelings with others. When children communicate ideas about mathematics they communicate, clarify, organize, and combine their math thinking. When children communicate, adults can find out more about what children think and know, and other children can learn ideas that might be different from their own.

Connections link new learning and experiences to previous learning and experience. These connections help to bridge informal, experience-based mathematics, and more formal, school mathematics. Adults can use connections to make mathematics learning more meaningful.

Representations show thought about mathematical ideas in different ways and with a variety of tools. This enhances understanding of math by making mathematical relationships more obvious. Representation is also important for recording information, for communicating solutions, and for explaining reasoning.

It is important to carefully and fully incorporate math processes into the learning of young children. Processes often reflect what adults need to do in order to facilitate implementation of the processes. For this reason, separate standards related to math processes have not been developed. Instead, italicized references to the corresponding math process are found under the Adult Supports for each Preschool Math Standard.

Area 7: Mathematics

Comparison, Number, and Operations - Infant and Toddler (birth - 3 years)

Standard 7.1.IT Infants and toddlers show increasing understanding of comparisons and amount, including use of numbers and counting.

Rationale - Why is this important for a child?

Infants and toddlers learn number skills as they work with small groups of objects in meaningful, routine tasks. Through rhymes, chants, and finger plays involving counting, they learn that numerals (numbers) have a constant sequence (order). In experiences that involve counting, children practice connecting numbers to objects as they begin to build the notion of one-to-one connections. Through repeated experiences of counting small groups of objects, they learn the last number in the counting sequence represents the total quantity, rather than the name of the last object (Gelman & Gallistel, 1978). Adults help children understand numbers and amount by providing many opportunities for children to explore and to count small groups of objects, and to hear and repeat familiar counting rhymes.

Comparison involves finding a relationship between two things or two groups of things. We know from behaviors that infants and toddlers are continually comparing objects, mentally grouping objects that are similar in shape, quantity, size, and texture (Thompson, 2001). Comparisons provide the basis for the development of measurement concepts and skills in older infants and toddlers. Adults who attach a verbal label to an object or comparison of focus to the infants or toddlers, such as big/small, heavy/light, hot/cold, help children build math-related vocabulary and understanding (Camaioni, 2004).
Area 7: Mathematics

Comparisons, Numbers, and Operations - Preschool (3 - 5 years)

Standard 7.1.PS Children understand counting, ways of representing numbers, and relationships between quantities and numerals.

Rationale - Why is this important for a child?

During the preschool years, children build basic understandings of numbers and amount (‘how many’). These understandings differ from the understandings of older children and adults. Children initially build understanding of amount through their hands-on actions with objects. After repeated experiences with small quantities of objects, they build an understanding of specific numbers.

Children learn to count with understanding when they match the counting sequence, one-to-one, with a group of objects (NCTM, 2000). When adults help children link understandings with objects to conventional numbers, children advance understanding of quantity (Mix, Huttenlocher, & Levine, 2002). Counting from the first number, and counting on from one number to another, provides the basis for later skills in formal addition (Fuson & Fuson, 1992).

Number operations are the tools children use to answer questions such as “How many now?” or “How many more or fewer?” When children focus on what happens when two sets are joined together or separated into parts, they learn quantities change. Children need many experiences comparing amounts to become familiar with thinking about differences between sets (Erikson Institute, 2014).
Area 7: Mathematics

Patterns - Infant and Toddler (birth - 3 years)

Standard 7.2.IT Infants and toddlers begin to recognize patterns.

Rationale - Why is this important for a child?

Children’s first encounter with patterns is not in school but in nature, at home, at play, and in stories (Copley, 2010). Patterning involves making or finding regular sequence in sounds, sights, or large/small motor experiences. Infants notice and remember patterns they see or hear. Infants visually group objects that are close together (Baillargeon, 1987). They recall and expect familiar sequences of events, such as the pattern of daily routines, and use memories to predict events and to respond accordingly. Learning to recognize, predict, and repeat patterns are a basic standard in mathematics education (NCTM, 2000).

Toward the end of their first year, many infants begin to figure out there is an order to their days (PBS.org/parents). Toddlers can organize objects and recognize patterns in a variety of ways. Toys, such as nesting cubes and stacking rings, help infants and toddlers explore and practice making patterns as well as practice seriation (placing objects in order such as from smallest to largest). Sorting objects into groups of similar objects also involves recognizing patterns. Toddlers may group objects by a variety of characteristics such as shape, colors, use, or size. With practice and development, infants and toddlers become better able to recognize, to create, and to extend patterns; and to organize objects in a variety of ways.
Area 7: Mathematics

Patterns - Preschool (3 - 5 years)

Standard 7.2.PS Children understand patterns.

Rationale - Why is this important for a child?

Recognizing patterns is an important forerunner to algebraic understanding (NCTM, 2000). Mathematics is the language and science of patterns (Copley, 2010). Patterns are everywhere in the curriculum. They appear in various sensations - auditory (hearing), tactile (touch), and kinesthetic (movement), and visual (seeing). Inviting young children to create a pattern musically (loud-soft-soft-soft, loud-soft-soft-soft-soft) or physically (jump-jump-clap, jump-jump-clap), especially helps them recognize and understand patterns. (Copley, 2010). Recognizing patterns helps children organize their world and facilitates problem solving. Working with and recognizing pattern helps children see relationships between objects and to make predictions.

Seriation, or organizing objects into a sequence, is one pattern such as lining items up from big to little. Children can learn the order of numbers, first, second, third, to last, to describe the sequence of objects or events. Adults support the learning of patterns through talking about patterns during daily events and play experiences.
Area 7: Mathematics

Shapes and Spatial Relationships - Infant and Toddler (birth - 3 years)

Standard 7.3.IT Infants and toddlers show increasing understanding of spatial relationships.

Rationale - Why is this important for a child?

Young infants begin to recognize spatial (actual things that exist) relationships during play and routines. The development of binocular vision (seeing with two eyes), at about four months of age in most children, helps this skill (Slater, 2004). Infants usually reach for closer objects rather than ones that are further away. Infants and toddlers distinguish shallow surfaces from deep ones, and avoid deep steps when they see them (Gibson & Walk, 1960). There is research which suggests children who play outdoors are less likely to be near-sighted; thus impacting how they see shapes (McBrien, Morgan, & Mutti, 2009; Rose, Morgan, Ip, Kifley, Huynh, Smith, & Mitchell, 2008).

Working with both two- and three-dimensional shapes provides the basis for geometry (NCTM, 2000). Infants and toddlers learn to sort or group three-dimensional shapes based on their uses (Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976). Infants and toddlers note and use shape differences before they have labels for shapes. For example, they may separate objects into those that roll and those that do not roll. Adults help children learn about shapes by providing a variety of toys and materials for young children to explore, compare, and classify, including puzzles and sorting canisters. Adults also help children understand shapes by labeling shapes children explore, and by using words that suggest comparisons, such as bigger or smaller. Adults also use directional words such as in, on, under, up, or down, in simple directions and in conversations with young children (Clements & Sarama, 2014).
Area 7: Mathematics

**Shapes and Spatial Reasoning - Preschool (3 - 5 years)**

**Standard 7.3.PS** Children understand shapes and spatial relationships.

**Rationale - Why is this important for a child?**

Recognizing shapes is the beginning of geometric understanding. The understanding of shapes requires children to actively manipulate shapes and to explore the characteristics and parts of shapes, rather than simply seeing and naming the shapes (Clements, 2014). Children’s concepts of shape may differ from mathematical concepts. This means children may limit triangles to only equilateral triangles, or not to classify squares as rectangles. Instruction from adults is needed to help children progress from recognizing shapes to understanding the characteristics of shapes.

Spatial relationships involve ideas related to position such as on, under, next to; direction; and distance such as near, far, next to, close to, of objects in space. Children develop understanding of space from actively manipulating materials and their own spatial environments (Clements & Battista, 1992). Spatial visualization involves seeing an object from different perspectives, and building and changing mental representations of both two and three-dimensional objects (Clements & Sarama, 2014). Through geometric modeling (methods and step-by-step sets of operations for the mathematical description of shapes) and spatial reasoning (visualizing three-dimensional images and mentally twisting and turning into other shapes), children learn to describe their physical environment and to build problem solving skills (NCTM, 2000).
Area 7: Mathematics

Measurement - Preschool (3 - 5 years)

Standard 7.4.PS Children understand comparisons and measurement.

Rationale - Why is this important for a child?

Children organize their experiences through sorting and classifying. Learning vocabulary words related to matching and comparisons helps children focus their attention and find similarities between objects (Sandhoffer & Smith, 1999). Making comparisons, such as similarities and differences, provides a basis for making patterns and generalizations. Exploring graphs provides a basis for understanding numbers, differences in amount, and probability (strong likelihood or chance of something).

Measurement, which provides a basis for comparison, is one of the most widely used applications of mathematics (NCTM, 2000). Children begin to understand measurement by comparing the size of objects. Young children experiment by lining up objects, and then begin to connect number to length as they use nonstandard measurement tools, such as links, blocks, or rods. Experimenting with tools that give different results, such as sometimes measuring with links and later measuring the same object with rods, is an essential step to understand why standard measuring rulers and measuring tapes are important for comparing measurements. Children also benefit from exploring and using tools with uniform units, such as rulers and centimeter cubes, as their measurement ideas and skills develop (Clements, 2003; Clements & Sarama, 2014). Young children explore measurement concepts through exploring and manipulating a variety of objects and materials within their environments. Children need hands-on experiences with objects and use of words by adults to learn how to describe relationships involving measurement.

Children’s initial ideas about the size or quantity of an object are based on perception. They think one object is bigger than the other object because it looks bigger. (Copley, 2010). They need many experiences in making comparisons and conversations - using sight, touch, and words - to help reach the right conclusion and that it was measured fairly (Erikson, pg. 103).

Time is a difficult measurement concept for children to learn because it is not a physical attribute of objects. Telling time develops well after kindergarten, although preschoolers develop an understanding of the passage of time as they go through predictable daily routines (Geist, 2009).
Area 7: Mathematics

Data Analysis - Preschool (3 - 5 years)

Standard 7.5.PS Children demonstrate the process of data analysis by sorting and classifying, asking questions, and finding answers.

Rationale - Why is this important for a child?

Children formulate meaningful questions, collect, represent, and analyze data to answer them. These questions relate to the child’s world, such as “How many children have birthdays in April?” or “How many children are wearing shoes that tie?” Because these types of questions are important to young children, they focus their attention on collecting and organizing relevant information. Allowing children to vote, by writing children’s names on slips of paper to record their votes, followed by displaying the votes on a graph, creates a record of the votes, that the children can refer to as they talk about the data (Copley, 2010; Moomaw, 2011). The foundation for data analysis, especially for young children, focuses on other areas, including counting and classification (Clements & Sarama, 2014).

As part of collecting data, children begin to sort and make groups (sets) by properties such as kind, color, shape, or size. As they refine sorting skills, they begin to sort by more than one attribute - size and color or shape and color, as examples. This is strengthened when they talk about their sorting, and describing their rules that define their categories. Typically, children sort by color, followed by size and shape. Other properties, such as sound, texture, and function, are also used as rules for sorting. Young children often sort inconsistently. Some children also begin to sort into two groups, such as a group of red and another group of not red. This two part classification - have/have nots - is important in collecting, graphing, and other representations of certain kinds of data (Copley, 2010).

Children younger than three years of age can classify intuitively (unthinkingly). At age three, most children can sort following verbal rules. During the preschool ages, many children learn to sort objects according to a given attribute, forming categories, although they may switch attributes during sorting. Not until age five or six do children usually sort consistently by a single attribute and re-classify by different attributes. Research suggests the process of classification and seriation (arranging into chronological order) are related to number knowledge (Clements & Sarama, 2014).
**Area 8: Science**

**Scientific Investigations - Infant and Toddler (birth - 3 years)**

**Standard 8.1.IT** Infants and toddlers gather and interpret information from the environment around them.

**Rationale - Why is this important for a child?**

As infants and toddlers observe the adults and environment around them, they begin to make connections in their environment, which in turn creates knowledge. Sensory play provides many opportunities for children to learn early science and engineering concepts (Hamlin & Wisneski, 2012; Sikder & Fleer, 2015) and spatial reasoning (Hanline, Milton, & Phelps, 2010; Miyakawa, Kamii, Nagahiro, 2005). Sensory experiences provide a natural environment for infants and toddlers to explore, identify, and attempt solutions, which all represent a process of scientific investigation and engineering thought (Hoisington & Winokur, 2015). Additionally, intentional and developmentally appropriate experiences provided by an adult that foster young children's conceptual development in physical, life, and earth science ensure young children form concepts that serve as a foundation for later scientific learning (Hoisington & Winokur, 2015). Infants and toddlers need time to repeat actions over and over to begin understanding how things work and to begin problem solving.

Scientists and engineers often refer to both the ‘natural’ and the ‘designed’ world. The natural world includes all living and nonliving things not made by humans. The designed world encompasses the components of our environment made or modified by humans, such as a rock and a stick tied together with grass to make a hammer. Daily and routine concrete experiences involve both the natural and designed worlds, and adults can skillfully use experiences to help young children become consciously aware of the scientific situations (phenomena) around them and to build conceptual knowledge about the natural and designed worlds (Hamlin & Wisneski, 2012; Hong & Diamond, 2012; Sikder & Fleer, 2015).
Area 8: Science

Scientific Investigations - Preschool (3 - 5 years)

Standard 8.1.PS Children gather information and conduct investigations to address their wonderings and test solutions to problems.

Rationale - Why is this important for a child?

Scientists and engineers often refer to both the ‘natural’ and the ‘designed’ world. The natural world includes all objects, materials, organisms, and natural phenomena, such as gravity, weather, and needs of living things - not developed or caused by humans. The designed world includes the components of our environment developed or modified by humans, such as a rock and a stick tied together with grass to make a hammer. Daily and routine concrete experiences involve both the natural and designed worlds and can be skillfully used by adults to help young children become consciously aware of the scientific situations (phenomena) around them and to build conceptual knowledge about the natural and designed worlds (Hamlin & Wisneski, 2012; Hong & Diamond, 2012; Sikder & Fleer, 2015).

Learning science is an active process (National Research Council, 2012) where children observe, compare, classify, and communicate their observations of events and objects (Eshach, 2005; Trundle, 2015). Children are introduced to earth/space science including meteorology, astronomy, and geology; physical science including physics and chemistry; and life science including biology, botany, and zoology. Children explore, investigate, and observe objects, materials, and organisms in the world around them. With support, children plan and carry out investigations to address scientific questions or to solve engineering design problems. “At all levels, they should engage in investigations that range from those structured by the [adult] - in order to expose an issue or question that they would be unlikely to explore on their own (e.g., measuring specific properties of materials) - to those that emerge from [children’s] own questions” (National Research Council, 2012, p. 61).

To develop understanding of science concepts, children need to actively engage in scientific practices including asking questions, obtaining information, and planning and carrying out investigations. It is important to acknowledge questions from young children are often ‘wonderings.’ An example is “I wonder what will happen if I push/pull/shake/drop this?” rather than fully expressed questions. Some questions are not expressed verbally, but an adult can infer questions from the actions and the explorations of the child.

To develop engineering habits of mind, children need time, space, and materials to pose their own design problems, to make, and to revise their design as they encounter unforeseen problems, and continue to eventual completion. This is expressed through play and ‘tinkering’ with materials until they produce the desired effect. Young children develop engineering habits of mind in their play as they devise, invent, and construct their own toys and games; as they construct towers with blocks; or as they move sand and fill in puddles of water (Petroski, 2003).
Adults play a central and important role in helping young children engage in science engineering. “Everyday life is rich with science and engineering experiences, but these experiences can best contribute to science learning when an adult prepares the environment for science exploration, focuses children’s observations, and provides time to talk about what was done and seen” (NAEYC, 2013, p. 18). “It is important that adults support children’s play and also direct their attention, structure their experiences, support their learning attempts, and regulate the complexity and difficulty of levels of information” (NRC, 2007, p. 3). It is equally important for adults to look for signs from children and to adjust the learning experiences to support the children’s curiosity, learning, and understanding.
Area 8: Science

Scientific Reasoning - Infant and Toddler (birth - 3 years)

Standard 8.2.IT Infants and toddlers use reasoning to make sense of information in their environment.

Rationale - Why is this important for a child?

Young infants are introduced to scientific concepts through their interactions with the living and nonliving world (Hong & Diamond, 2012; Martin, Raynice, & Schmidt, 2005). For example, play offers situations that demonstrate cause and effect. Some events then lead to others (Spelke, Katz, Purcell, Ehrlich, & Breinlinger, 1994). Infants and toddlers show surprise when events occur that do not follow expected sequences. For example, four-month-old infants show surprise when a toy train disappears into a tunnel without emerging on the other side (Baillargeon, 1987). This expectation is the beginning of object permanence. However, actually retrieving an object that disappears in an unusual location requires motor control of reaching, which develops later. Infants typically observe the results of their actions and sometimes repeat them, showing surprise if the results are not the same as before. Toddlers deliberately vary their actions, watching what happens each time (Piaget, 1971).

Adults promote the development of scientific reasoning by providing young children with safe environments for play and interesting materials to explore (Hamlin & Wisneski, 2012; Hong & Diamond, 2012; Sikder & Fleer, 2015; Wachs & Combs, 1995). Regular, year-round experiences with nature, both indoors and outdoors, will provide unique learning experiences about the world.
Area 8: Science

Scientific Reasoning - Preschool (3 - 5 years)

Standard 8.2.PS Children use reasoning to make sense of information and design solutions to problems in their environment.

Rationale - Why is this important for a child?

“As they interact with the world around them, young children develop their own complex and varying theories about this world” (Chaille, 2003). Children are sensitive to patterns and causal connections, and can use this information to guide the ways in which they generalize, make interpretations, and make sense of the world (National Research Council, 2007).

Preschool children use reasoning and inquiry as they investigate and make sense of how the world works (National Research Council, 2007, 2012; National Science Teachers Association, 2014). Through reasoning, children begin to develop different types of scientific knowledge: (1) factual, (2) conceptual and (3) procedural. **Factual** knowledge is knowledge of specific events and situations. **Conceptual** knowledge is knowledge of principles that bring many pieces of factual knowledge together into a unified whole. **Procedural** knowledge is knowledge of how to apply factual knowledge and/or conceptual knowledge to specific problem-solving situations (Counsell et. al., 2016). Children are active participants in this process of building abstract learning (National Research Council, 2000, 2012; National Science Teachers Association, 2014). Very young children gain factual knowledge directly through experience. Then they begin to explore cause and effect relationships, such as putting different size rocks in water and watching as the rocks sink to the bottom. Although children do not possess specific knowledge about **why** objects sink or float, they demonstrate their attempts to pull together pieces of factual knowledge and to unify them into a concept they can use to explain and predict events. Their factual and conceptual knowledge may be partially or entirely incorrect. As they continuously organize bits and pieces of factual knowledge into concepts, they tend to organize their procedural knowledge into ‘practical’ theories about the physical world, and use them in problem solving. With each experience, these practical theories are further refined (Counsell et al., 2016).

“Young children develop science understanding best through multiple opportunities to engage in science exploration and experiences through inquiry” (Bosse, 2009; Gelman, 2010). As children engage in science and engineering practices, they can observe, compare, classify, measure, and communicate their observations of occurrences (Charlesworth & Lind, 1999). They make meaning from experiences based on evidence and make predictions about future events. They describe their observations and compare them to their predictions (Piaget, 1980). In addition to direct experiences, children’s theories and understandings are enhanced through interactions with peers and trusted adults (Conzeio, 2002; National Research Council, 2012). Young children are able to draw on information from a range of sources, including their own perception, the testimony of other children and adults, and the interpretations they draw from observations and informational texts (Harris, 2002; National Research Council, 2007). Knowledge and understanding are built best through multiple opportunities to engage in learning experiences that fit together around the same scientific concept.
Scientific Communication - Infant and Toddler (birth - 3 years)

Standard 8.3.IT Infants and toddlers share information and understanding about experiences in their environment.

Rationale - Why is this important for a child?

Infants and toddlers use several methods to communicate their beginning science understanding. This is the foundation for children to develop and to share claims using evidence (Moulding, Bybee, & Paulson, 2015). Adult interaction and guidance is critical to support infants and toddlers in beginning scientific communication (Hamlin & Wisneski, 2012; Head Start, 2014). Adults can support infant and toddler learning through thoughtful questioning and listening as children explore their environment (Harlan & Rivkin, 2012; Head Start, 2014). As an example, when a toddler hits blocks with a toy hammer, the adult says, "You are making a loud noise when you hit the blocks with the hammer." The toddler continues to hit the blocks and the blocks fall down. The adult says, "You hit the blocks with the hammer and the blocks fell down." Providing infants and toddlers with opportunities to make and to handle models, and to draw pictures, which may not be recognizable, encourages scientific communication (Hamlin & Wisneski, 2012; Head Start, 2014). Adults indirectly guide children’s thinking when they model their own reasoning process by ‘thinking out loud’ (Harlan & Rivkin, 2012; Head Start, 2014; Moulding et al., 2015.). “Modeling and labeling thought, adults offer children conscious knowledge of non-conscious thinking processes” (Harlan & Rivkin, 2012, p. 34).

Adults should keep in mind that young children develop science skills and learning by engaging in experiential learning. After children experience the joy of figuring something out, teachers can use picture books that provide children confirmation of their interests and findings. It is not enough to only read and to tell stories about science, but giving children hands-on science experiences is critical (Hoffman, Collins, & Schickedanz, 2015).
Area 8: Science

Shapes and Spatial Reasoning - Preschool (3 - 5 years)

Standard 8.3.PS Children share information and understanding about experiences in their environment.

Rationale - Why is this important for a child?

Scientific communication through reading, writing, speaking, viewing, and listening is the next step of scientific investigations and reasoning. Communicating in multiple ways provides children with the opportunity to boost their understanding of information gained through combined, active learning experiences. When children are allowed to communicate their understanding, it adds meaning to their investigations. Caring adults can support children in communicating their findings based on evidence rather than opinion (Moulding, Bybee, & Paulson, 2015). Communication provides children an opportunity to make explanations and design solutions, as well as engage in argument from evidence (Siry & Lang, 2010). Adults guide children to value other’s ideas and use those ideas in combination with their own claims to revise their findings (Harlan & Rivkin, 2012; Head Start, 2014; Moulding et al., 2015). Communication provides reasons for children to represent experiences through many formats beyond words that are most relevant to their learning and understanding, such as drawings, journals, graphs, and models.

Communication allows adults to support children’s learning at the necessary level of development that allows the curiosity of each child to lead the conversation about their results. They learn to make deductions and to predict future events (Piaget, 1980). This communication builds partnerships between children and adults, and with other children. Their feedback is valued and drives the planning and learning opportunities offered within the environment. These opportunities continue to provide interaction as a way of building language, social and emotional capabilities, and content knowledge.

“Argument in science goes beyond reaching agreements in explanations and design solutions. Whether investigating a phenomenon, testing a design, or constructing a model to provide a mechanism for an explanation, children are expected to use argumentation to listen to, compare, and evaluate competing ideas and methods based on their merits” (NGSS, 2013, pg. 13). Engaging in argument from evidence builds on prior experiences and continues through comparing ideas and representations about the natural and designed world (NGSS).