

**Cognition and General Knowledge (Online) – Syllabus** Fostering the Development of Young Children’s Cognition and General Knowledge (Cognition, Mathematics, Science) Skills

**Course Description:**

Early in childhood, children’s cognitive skills develop substantially and provide an important foundation for later learning. Instructional practices that promote the development of these important skills and support children’s understanding of the world around them are crucial. Online discussions and activities designed to promote cognition, mathematics, and science knowledge and skills can capitalize on children’s natural curiosity and provide rich opportunities for learning.

This course is designed to increase participants’ knowledge of and ability to implement instructional strategies aimed at promoting the following: (a) cognition skills including reasoning and problem solving, and symbolic representation; (b) mathematical skills in specific domains including number and operations, geometry and measurement, and data; and (c) science knowledge (understanding of core ideas and science concepts in life, physical and earth sciences) as well as key science skills or practices (such as observing and asking questions, planning and conducting investigations, collecting data and constructing explanations, and reporting and reflecting on findings). The course is designed to increase participants’

knowledge of, and ability to implement, high quality strategies that support children’s learning in developmentally appropriate ways.

**Goals:**

The overarching goal of this course is to:

• Increase participants’ **knowledge** of the development of children’s early cognition and mathematical and scientific thinking and their relationship to important instructional practices;

• Provide opportunities for participants to **see** teacher-child interactions and specific instructional strategies that elicit children’s cognition, mathematical, and scientific knowledge and skills;

• Implement strategies that support and elicit participants’ cognition, mathematical, and scientific knowledge and skills, taking advantage of informal and formal opportunities to engage in instruction; and

• Support **reflection** by inviting participants to analyze and assess their classroom strategies related to cognition, mathematics, and science and then plan for improvement.

**Learning Objectives:**

At the end of this course, you will be able to:

• Describe the development of children’s cognition, mathematics, and scientific reasoning skills and use teacher strategies to support them.

• Identify strategies to support children’s cognition, mathematics, and scientific reasoning skills in videos of early childhood classrooms

• Practice enacting and exhibiting effective strategies to support young children’s cognition, mathematics, and scientific reasoning skills.

• Use culturally relevant teaching strategies by applying sociocultural knowledge of differences in the development of and dispositions toward cognition, mathematical, and scientific reasoning skills and approaches to learning.

• Demonstrate appropriate use of ongoing child observation and assessment to guide teaching and facilitate children’s development and learning.

• Identify, evaluate, and create learning environments that support children’s cognition, mathematics, and scientific reasoning development.

The Intentional Teaching Framework serves as a guide for this course. This framework gives course participants the opportunity to know, see, do and reflect upon the new skills that they learn (see below). The content of this course lends itself specifically to knowing, doing and reflecting and there will be many opportunities to engage in all of these practices throughout the course. Participants will also have the opportunity to see this information presented in a variety of ways in order to enhance learning.



**Know** = Gain knowledge of child development and specific teaching practices for cognition, mathematics, and scientific reasoning.

**See** = For the purpose of this course, this relates to the opportunity to see information presented in a variety of ways. You will have opportunities to objectively describe what is happening in video clips of your own and others classrooms, using specific behavioral language.

**Do** = Set goals, plan, implement strategies (**Do** can also involve enacting knowledge within the context of “in class” activities)

**Reflect** = Observe your practice, assess, analyze, plan for change

**Grading, Assignment Expectations, and Time Estimations:**

**Grading**

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| Weekly Assignments | 30% |
| End-of-Session Test Your Knowledge | 10% |
| Family Talk Assignments | 10% |
| Discussion Board Participation | 10% |
| Mid-Term Assignment | 20% |
| Final Assignment | 20% |

**Assignment Expectations**

**Weekly Assignments** (30%: Grading: per assignment rubric).

Weekly assignments provide practitioner-focused time to make meaning from course readings, videos, and eLearning activities. Assignments vary and may include lesson plan development, filming yourself delivering classroom activities with children, reflection, action plans, graphic organizers, and practice using skills in your daily life.

• Reading Assignments and Graphic Organizers (10% of grade): In this course, you will complete required readings. At times, you will synthesize your thoughts from the readings in reflection assignments. You will create graphic organizers. Creating a graphic organizer is an exercise of your own ability to symbolically represent the ideas presented in this course. It also provides you with a useful artifact you can refer to later of the important ideas and connections to practice that you will make throughout this course.

Study about graphic organizers: <https://en.wikipedia.org/wiki/Graphic_organizer>

Use this resource to access a wide variety of graphic organizer blank templates. <http://www.educationoasis.com/curriculum/graphic_organizers.htm>

• Lesson Plan Assignments (10% of grade): In this course, you will be preparing lesson plans (activity plans). You will build a portfolio of activity plans for cognition, mathematics, and scientific reasoning domains per the Head Start Early Learning Outcomes Framework (HSELOF).

• Videos of Yourself in the Classroom and Communities of Reflection and Practice (10% of grade): In this course, you will be working in Communities of Reflection and Practice (CORP) to share and view videos of cognition, mathematics, and scientific teaching with children. Your participation in this group is meant to help you form personal connections with one another and facilitate high-level collaboration among yourselves. In this course, you will video record yourself working with children (Cognition, Mathematics, and Science lessons and activities). You will post your video recording with a brief

description on either Canvas or Coaching Companion. Your Instructor and CORP will provide feedback on your video. At the end of the course, you will use your videos and feedback to synthesize your learning and impact on practice with children over the course.

**End-of-Session Test Your Knowledge** (10%: Grading: point values)

At the end of each session’s expert video presentations and eLearning review activities, participants must complete a knowledge check. The scope of these knowledge checks is only on the expert video presentations and any external video presentations. You may see some repetition from the eLearning review activities and that is acceptable. Remember that the eLearning review activities are not graded. Only the knowledge checks contribute to your overall course grade; hence it behooves you to complete all video viewings and eLearning review activities.

Notes on number of attempts:

• You are allowed one (1) attempt for a score on each Test Your Knowledge. You can retake quizzes more times but no further scoring will occur.

• After you complete the quiz, you will be able to review your answers and view feedback.

• Consult your Instructor for any retake requests.

**Family Talk Assignments** (10%; Grading: per assignment rubric)

Throughout this course, there are “Family Talk” assignments. The objective of the Family Talk assignments is give you the opportunity to take what you have learned in a session, put it into your own words, and be able to have a discussion about the topic with families. Being able to engage families in a meaningful way with the ideas in this course is a powerful tool for improving child outcomes. Successful assignments are those that are linked to course readings and videos. Opinions are not enough; they should be supported by what you are learning in the course. Your contributions to Family Talk demonstrate that you have made meaning of the material and are able to communicate and have useful conversations with your students’ families. You will be sharing your ideas with your peers and have the opportunity to build a ‘tool kit’ for working with families that includes contributions from the whole.

**Discussion Board Participation** (10%: Grading: per rubric)

Each student is expected to participate on the weekly discussion board. This represents our in- class discussion. These online discussions allow you and your classmates to discuss the material together and help each other make relevant connections to other ideas and to your practice. Participating in discussion boards not only represents your learning, but actually supports your learning. The objective of the discussion board is to give you the opportunity to take what you have learned in this session and put it into your own words. The ability to do this demonstrates that you have made meaning of the material.

For the most part, the Instructor will not take part in these discussions; however, the Instructor will be reading the posts and reserves the right to join in the conversations. In this way, the Instructor will participate when further information or clarification is needed.

**Mid-Term Assignment** (20%: Grading: per assignment rubric).

Becoming a better educator is a never-ending journey. The mid-term assignment gives you an opportunity to think about your journey so far in this course. You will get an opportunity to demonstrate competencies from topics in the first half of this course.

**Final Assignment** (20%: Grading: per assignment rubric).

As with the mid-term assignment, the final assignment gives you an opportunity to think about your journey in the entire course. You will reflect on how far along you are and where you would like to go. You will get an opportunity to demonstrate competencies from topics in the course and develop action plans for the future.

**Time Estimations**

The estimated time commitment for all learning activities for a session is 10 hours (600 minutes). The estimate is derived from as if participants attended an in-person class for 150 minutes 2-3 times per week (plus any travel requirements) and out of class readings, video viewings, expert video presentations, eLearning review activities, and graded assignments. The mid-term assignment and the final assignment are estimated to take 5-10 hours to complete.

The time estimations are generalized. Some participants may complete a session more quickly than others. Some participants may wish to review readings and videos multiple times and spend more quality time on their assignments. There is no exact time designation; you are encouraged to communicate with your Instructor for any questions on due dates and extensions.

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| **Session** | **Title** | **Topics and Activities** | **Required Readings and Viewings** | **Assignments** |
| 1 | What isCognition? | Know (Videos and eLearningActivities):• How are Cognition, Mathematics, and Science All Connected?• Why is CognitionImportant?• Why is Math Important?• Why is ScienceImportant?• The ABCs of the Mind• Culture/Family as framework for how we think about the world• Talk MovesSee:• N/ADo:• Review Syllabus• Family Talk: What questions might you ask families to get an idea of the values, beliefs, practices around thinking?Reflect:• Peer Discussion: Introduction, hopes for | U.S. Department of Health and Human Services, Administration for Children and Families, Office of Head Start (HHS/ACF/OHS). (2015). *Getting started with the Head Start Early Learning Outcomes Framework*.[http://eclkc.ohs.acf.hhs.gov/hsl c/hs/sr/approach/pdf/getting-started.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/getting-started.pdf)HHS/ACF/OHS. (2015). *Head Start Early**Learning Outcomes Framework*, 50-56.[http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/a pproach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Medin, D. & Bang, M. (2013). Culture in the classroom. *Phi Delta Kappan*, *95*(4), 64-67. <http://journals.sagepub.com/doi/full/10.1177/003172171309500414> **Note:** This article is available online only at institutions with a license for the journal database. | Test Your Knowledge Discussion Board (2) Family Talk |

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|  |  | this course, sharing about names• Peer Discussion: How are Cognition, Math, and Science topics currently connected at your early learning setting? |  |  |
| 2 | The Development of Self- Regulation and Learning | Know (Videos and eLearningActivities):• Mutual to Self- Regulation• Self-Regulated Learning and The ABCs of the Mind• Motivation• The Growth MindsetSee:• N/ADo:• Family Talk: What questions would you ask families to discover what kind of ‘mindset’ (per Dweck video) they have around learning?• Self-regulated learning log: goals, challenges, strategies, motivators. | Harden B. (2016, February 24). How babies begin to develop self-control in the first 3 years [audio file]. <https://www.zerotothree.org/resources/280-how-babies-begin-to-develop-self-control-in-the-first-3-years> Dweck, C. (2014, November). The power of believing that you can improve. *TED Talks*. [http://www.ted.com/talks/carol\_dweck\_the\_ power\_of\_believing\_that\_you\_can\_improve](http://www.ted.com/talks/carol_dweck_the_power_of_believing_that_you_can_improve?language=en)[?language=en](http://www.ted.com/talks/carol_dweck_the_power_of_believing_that_you_can_improve?language=en)Pink, D. (2010, April). Drive: The surprising truth about what motivates us. *RSA Animate*. [https://www.thersa.org/discover/videos/rsa- animate/2010/04/rsa-animate---drive/](https://www.thersa.org/discover/videos/rsa-animate/2010/04/rsa-animate---drive/)Optional:Weinstein, C. E., Schulte, A.C., & Palmer, D. R. (2015). *Learning and study* Weinstein, C. E., Schulte, A.C., & Palmer, D. R. (2015). *Learning and study* | Test Your Knowledge Discussion Board Family TalkGraded Assignment: Self- Regulated Learning Log #1 |

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|  |  | Reflect:• Peer Discussion: Mutual vs. Self-regulation; “growth mindset”, motivation | *strategies inventory (Web LASSI)*. Clearwater, FL: H&H Publishing. Institutions and/or individuals may wish to purchase and use for this session.[http://www.hhpublishing.com/\_ass essments/LASSI/index.html](http://www.hhpublishing.com/_assessments/LASSI/index.html) |  |
| 3 | Cognition: How Does It Develop? | Know (Videos and eLearningActivities):• Reasoning and ProblemSolving• "What Do BabiesThink?"• How ReasoningDevelops• Strategies to Foster Reasoning and Problem Solving SkillsSee:• Video observations of teachers and children in the classroomDo:• Baseline video• Annotate a lesson planReflect:• Peer Discussion: Development of | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 52-56. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Deloache, J. S. (2007, June 1). Mindful of symbols. Scientific American.. <https://www.scientificamerican.com/article/mindful-of-symbols-2007-06/> Gopnik, A. (2011, July). What do babies think? *TED Talks*. [http://www.ted.com/talks/alison\_gopnik\_wh at\_do\_babies\_think?language=en#t-](http://www.ted.com/talks/alison_gopnik_what_do_babies_think?language=en&amp;t-534650)[534650](http://www.ted.com/talks/alison_gopnik_what_do_babies_think?language=en&amp;t-534650) | Test Your KnowledgeDiscussion BoardGraded Assignment: Baseline VideoGraded Assignment: Baseline Video ReflectionGraded Assignment: Annotate a Lesson Plan |

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|  |  | children’s cognition skills• Reflection on baseline video |  |  |
| 4 | Cognition: How Do We Represent What We Know? | Know (Videos and eLearningActivities):• SymbolicRepresentation• Making Connections• Strategies to Foster Symbolic Representation• Visual ThinkingStrategiesSee:• Video observations of teachers and children in the classroomDo:• Video of cognition learning opportunity• Graphic organizerReflect:• Reflection: Swartz article(playdough)• Family Talk: Use VTS prompts to talk with families about their | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 52-56. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Deloache, J. S. (2007, June 1). Mindful of symbols. Scientific American.. <https://www.scientificamerican.com/article/mindful-of-symbols-2007-06/> Swartz, M. (2005). Playdough: What’s standard about it? *Young Children, 60*(2),100–109. <https://cpin.us/sites/default/files/CC/VPA/docs/visual/playdough_young_children.pdf> Visual Thinking Strategies (2008, August18). *Visual Thinking Strategies.*Focus on these segments• 0:00 - 1:18 min – example of VTSuse of 3 questions• 1:18 - 2:10 – Philip Yenawine and identifying purpose• 2:11 - 3:10 – examples of children thinking and wondering and | Test Your KnowledgeFamily TalkGraded Assignment: ReflectionGraded Assignment: Graphic Organizer #1Graded Assignment: Video of Cognition Learning OpportunityGraded Assignment: VideoReflectionCORP Feedback |

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|  |  | children’s work; differences in the role of symbolic representation in families’ cultures• Video reflection | statement (re: need for critical thinking skills)[https://www.youtube.com/watch?v=aVzckn](https://www.youtube.com/watch?v=aVzcknOWpaE)[OWpaE](https://www.youtube.com/watch?v=aVzcknOWpaE)DeLoache, J. (2010, May). Mind in the making – life skills for kids – making connections. *Daily Motion*. [http://www.dailymotion.com/video/xdaneq\_ mind-in-the-making-life-skills-for\_people](http://www.dailymotion.com/video/xdaneq_mind-in-the-making-life-skills-for_people) |  |
| 5 | Introduction to Early Mathematics | Know (Videos and eLearningActivities):• Math Standards andCommon Core• MathematizingSee:• Video observations of teachers and children in the classroomDo:• Math Activity - Plan• Video: Math Activity - PlanReflect:• CORP feedback on peers’ videos from previous session | HHS/ACF/OHS*. Head Start Early Learning Outcomes Framework*, 55-61. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). Kindergarten: Introduction. In *Common Core State Standards for mathematics.* Washington, DC: National Governors Association Center for Best Practices, Council of Chief State School Officers. [http://www.corestandards.org/Math/Content](http://www.corestandards.org/Math/Content/K/introduction/)[/K/introduction/](http://www.corestandards.org/Math/Content/K/introduction/)Schwerdtfeger, J. K. & Chan, A.(2007). Counting Collections. *Teaching Children Mathematics*,*13*(7), 356-361. [http://www.jstor.org/stable/41198966?origin](http://www.jstor.org/stable/41198966?origin=JSTOR-pdf&amp;seq=1&amp;page_scan_tab_contents)[=JSTOR-](http://www.jstor.org/stable/41198966?origin=JSTOR-pdf&amp;seq=1&amp;page_scan_tab_contents) | Test Your KnowledgeDiscussion BoardGraded Assignment: MathActivity – PlanGraded Assignment: MathActivity – Do, Reflect |

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|  |  | • Peer Discussion: How children develop numeracy and counting skills, relate to your early learning setting• Reflect on video of MathActivity - Plan | [pdf&seq=1#page\_scan\_tab\_contents](http://www.jstor.org/stable/41198966?origin=JSTOR-pdf&amp;seq=1&amp;page_scan_tab_contents) **Note:** This article is available online at institutions with a license for the JSTOR database, or by creating a JSTOR account, which allows limited access to content.  |  |

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| 6 | Early Math: Number Concepts | Know (Videos and eLearningActivities):• Introduction to NumberSense• Number Core• Relations Core• Operations Core• Trajectory of NumberSenseSee:• Video observations of teachers and children in the classroomDo:• Mathematics InteractionPlanningReflect:• Peer Discussion: Video viewings from the Erickson Early Math Collaborative, relate to your early learning setting• Family Talk: What questions might you ask | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 57-59. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)McCray, J. (2013, February 18). Myths of early mathematics (Part 2)*. Erickson Early Math Collaborative*. [http://earlymath.erikson.edu/myths-of-early- mathematics-part-2/](http://earlymath.erikson.edu/myths-of-early-mathematics-part-2/)Using number paths with Child 2. (2013, February 10). *Erickson Early Math Collaborative*. [http://earlymath.erikson.edu/using-number- paths-with-child-2/](http://earlymath.erikson.edu/using-number-paths-with-child-2/)Organizing Bears with Child 15. (2013,April 5). *Erickson Early Math Collaborative*. [http://earlymath.erikson.edu/organizing- bears-with-child-15-maths-primary-school/](http://earlymath.erikson.edu/organizing-bears-with-child-15-maths-primary-school/)Estimating quantity with Child 9. (2014, April 3*). Erickson Early Math Collaborative*. [http://earlymath.erikson.edu/estimating- quantity-with-child-9-practical-math-skill- and-comprehension/](http://earlymath.erikson.edu/estimating-quantity-with-child-9-practical-math-skill-and-comprehension/) | Test Your Knowledge Discussion Board Family TalkGraded Assignment: Mathematics Interaction Planning |

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|  |  | families to get an idea of their beliefs around numbers and operations? |  |  |
| 7 | Geometry, Spatial Sense, and Measurement | Know (Videos and eLearningActivities):• How Spatial SenseDevelops• How Geometric SenseDevelops• How MeasurementSense DevelopsSee:• Video observations of teachers and children in the classroom• Video analysisDo:• Graphic organizer• Video: MathematicsInteraction PlanReflect:• Peer Discussion: Clements and Sarama article, how children develop geometry skills.• Reflection on video of | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 60-61. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Clements, D.H. & Sarama, J.(2000). Young children's ideas about geometric shapes. *Teaching Children Mathematics*, *6*(8), 482-488.[http://www.jstor.org/stable/41197461?seq=](http://www.jstor.org/stable/41197461?seq=1&amp;page_scan_tab_contents)[1#page\_scan\_tab\_contents](http://www.jstor.org/stable/41197461?seq=1&amp;page_scan_tab_contents)**Note:** This article is available online at institutions with a license for the JSTOR database, or by creating a JSTOR account, which allows limited access to content.Sorting geo solids with Child 5. (2013, July30). *Erickson Early Math Collaborative*. [http://earlymath.erikson.edu/sorting-geo- solids-with-child-5/](http://earlymath.erikson.edu/sorting-geo-solids-with-child-5/)Davidson Films (producer). Building Mathematical Competencies in Early Childhood. (2012, August 20). [http://www.youtube.com/watch?v=BMoF-](http://www.youtube.com/watch?v=BMoF-hiH3J8) | Test Your KnowledgeDiscussion BoardGraded Assignment: Video Analysis of Geometry DevelopmentGraded Assignment: Graphic Organizer #2Graded Assignment: Video of Mathematics Interaction PlanGraded Assignment: Video Reflection – Mathematics Interaction PlanCORP Feedback |

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|  |  | Mathematics InteractionPlan | [hiH3J8](http://www.youtube.com/watch?v=BMoF-hiH3J8) |  |
| 8a | Mathematizing | Know (Videos and eLearningActivities):• Goals of Mathematizing• Mathematizing: Providing Language• Mathematizing: DrawingOut LanguageSee:• Video observations of teachers and children in the classroomDo:• Family Talk: Anderson and Gold article. How might you discover families’ math identifies and how might you build a better bridge between home and school math identities?• Math Activity Plan – Mathematizing• Video – MathematizingReflect:• CORP feedback on | McNeil, T. BU’s Project Challenge has‘exponential’ promise. Part two: Equation + discussion = opportunity. (2007, April 27). Republished from *Bostonia* (2007, Spring). [http://www.bu.edu/today/2007/bu%E2%80](http://www.bu.edu/today/2007/bu%E2%80%99s-project-challenge-has-%E2%80%98exponential%E2%80%99-promise-2/)[%99s-project-challenge-has-](http://www.bu.edu/today/2007/bu%E2%80%99s-project-challenge-has-%E2%80%98exponential%E2%80%99-promise-2/)[%E2%80%98exponential%E2%80%99- promise-2/](http://www.bu.edu/today/2007/bu%E2%80%99s-project-challenge-has-%E2%80%98exponential%E2%80%99-promise-2/)Casey, B., Erkut, S., Ceder, I., & Young, J. M. (2008b). Use of a storytelling context to improve girls’ and boys’ geometry skills in kindergarten. *Journal of Applied Developmental Psychology, 29*(1), 29-48.[http://www.sciencedirect.com/science/articl e/pii/S0193397307001256](http://www.sciencedirect.com/science/article/pii/S0193397307001256)**Note:** This article is available online only at institutions with a license for the journal database.Anderson, D. D. & Gold, E. (2006). Home to school: Numeracy practices and mathematical identities. *Mathematical Thinking and Learning*, *8*(3), 261-286.[http://www.tandfonline.com/doi/pdf/10.1207](http://www.tandfonline.com/doi/pdf/10.1207/s15327833mtl0803_4)[/s15327833mtl0803\_4](http://www.tandfonline.com/doi/pdf/10.1207/s15327833mtl0803_4)**Note:** This article is available online only at | Test Your Knowledge Discussion Board Family TalkGraded Assignment: Math Activity Plan - MathematizingGraded Assignment: Video– MathematizingGraded Assignment: VideoReflection – MathematizingCORP Feedback |

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|  |  | peers’ videos from previous session• Peer Discussion: Casey and Erkut article. Storytelling to promote early math skills.• Reflect on Video – Mathematizing | institutions with a license for the journal database. |  |
| **8b Mid- Term** |  | Know, Do, Reflect:• 1 new activity plan(Cognition)• 1 new activity plan(Mathematics)• Video of ***one*** of the new activity plans• Reflection on video |  | **Mid-Term Assignment**• **Progress Check on Cognition and Mathematics in Practice: 2 new activity plans** |
| 9 | Introduction toEarly Science | Know (Videos and eLearningActivities):• Child Development andEarly Science Learning• Science Outdoors• Culture and Language inEarly Science LearningSee:• Video observations of teachers and children in the classroom | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 62-65. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Brenneman, K., Stevenson-Boyd, J. S., & Frede, E. (2009). Math and science in preschool: Policies and practice. *Preschool Policy Brief* 19. <http://nieer.org/policy-issue/policy-brief-math-and-science-in-preschool-policies-and-practice>  | Test Your Knowledge Discussion Board Family TalkGraded Assignment: Science Activity PlanningSelf-Regulated LearningLog #2 |

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|  |  | Do:• Family Talk: What might the challenges be when talking with parents about science? Howmight you address these challenges?• Science ActivityPlanningReflect:• CORP feedback on peers’ videos from previous session• Peer Discussion: Why is teaching science in early childhood important? What are key insights for you from the readings and videos?• Self-Regulated Learning Log progress, updates, and adjustments reflection | McLennan, D. P. (2017). Math learning—and a touch of science—in the outdoor world. Teaching Young Children, 10(4). <https://www.naeyc.org/resources/pubs/tyc/apr2017/math-learning-outdoors> Medin, D., & Bang, M. (2013). Culture in the classroom. *Phi Delta Kappan, 95*(4),64-67.<http://pdk.sagepub.com/content/95/4/64>**Note:** This article is available online only at institutions with a license for the journal database. |  |
| 10 | How Do Young Children Learn Science? | Know (Videos and eLearningActivities):• Focal Practice: Asking Questions + exploring ideas• Focal Practice: | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 62-65. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Hamlin, M., & Wisneski, D. B. | Test Your KnowledgeDiscussion BoardGraded Assignment: Video of Science Activity Plan |

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|  |  | Exploring andExperimenting• Focal Practice: Making observations and Narrating and ExplainingSee:• Video observations of teachers and children in the classroomDo:• Video of Science ActivityPlanReflect:• Peer Discussion: Per Hamlin article and Patrick article.• Reflection on video ofScience Activity Plan | (2012). Supporting the scientific thinking and inquiry of toddlers and preschoolers through play. *Young Children*, *67*(3), 82-88. <https://scienceinprek.si.edu/sites/default/files/NAEYC%20Science%20Article%20%281%29.pdf> Patrick, H., Mantzicopoulos, P., & Samarapungavan, A. (2009). Reading, writing, and conducting inquiry about science in kindergarten. *Young Children*, *64*(6), 32.[http://www.researchgate.net/publication/25](http://www.researchgate.net/publication/257981023_Reading_writing_and_conducting_inquiry_about_science_in_kindergarten)[7981023\_Reading\_writing\_and\_conducting](http://www.researchgate.net/publication/257981023_Reading_writing_and_conducting_inquiry_about_science_in_kindergarten)[\_inquiry\_about\_science\_in\_kindergarten](http://www.researchgate.net/publication/257981023_Reading_writing_and_conducting_inquiry_about_science_in_kindergarten)Cagla, G. (2011). Physics inpreschool. *International Journal of Physical Sciences*, *6*(4), 939-943. [http://www.academicjournals.org/article/arti cle1380804267\_Gur.pdf](http://www.academicjournals.org/article/article1380804267_Gur.pdf)Ashbrook, P. (2011). Recording data with young children. *Science and Children,**48*(5), 22-23. <http://static.nsta.org/files/sc1105_22.pdf> | Graded Assignment: Video Reflection – Science Activity PlanCORP Feedback |
| 11 | Science Domains and Connections | Know (Videos and eLearningActivities):• Domains for Early | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 62-65. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf) | Test Your KnowledgeDiscussion Board |

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|  | to Other Early Learning Domains | Science Learning• Connecting Science andLiteracy Learning• Early Physics LearningSee:• Video observations of teachers and children in the classroomDo:• Video of Science ActivityPlanReflect:• CORP feedback on peers’ videos from previous session• Peer Discussion: Per articles. How can you take science and foster language and literacy development in your early learning setting? What can you do to set up your classroom for physical science? How can you use the six suggestions in your early learning setting? | [oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Conezio, K., & French, L. (2002). Science in the preschool classroom: Capitalizing on children's fascination with the everyday world to foster language and literacy development. *Young Children, 57*(5), 12–18. [https://www.researchgate.net/publication/237714574\_Science\_in\_the\_Preschool\_Classroom\_Capitalizing\_on\_Children's\_Fascination\_with\_the\_Everyday\_World\_to\_Foster\_Language\_and\_Literacy\_Development](https://www.researchgate.net/publication/237714574_Science_in_the_Preschool_Classroom_Capitalizing_on_Children%27s_Fascination_with_the_Everyday_World_to_Foster_Language_and_Literacy_Development) Van Meeteren, B., & Zan, B. (2010). Revealing the work of young engineers in early childhood education. Early Childhood Research and Practice. <http://ecrp.uiuc.edu/beyond/seed/zan.html>  | Graded Assignment: Revision of Science Activity PlanGraded Assignment: Video of Revised Science Activity PlanCORP Feedback |

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| 12 | Science Lesson Examples: Reflection, Revision, Assessments | Know (Videos and eLearningActivities):• Assessing and Documenting Early Science LearningSee:• Video observations of teachers and children in the classroomDo:• Family Talk: Describe a typical child activity and identify how the children are being ‘scientists’ (be specific in the skills they are using) then provide follow up questions to help families think about how they might (or might already) supportscientific thinking in their daily routines.• Graphic organizer• Revise Science ActivityPlan• Video of Science ActivityPlanReflect: | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 62-65. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Trundle, K., Miller, H., & Krissek, L. (2013). Digging into rocks with young children. *Science and Children, 48*(2), 46-51. <https://www.researchgate.net/publication/258287547_Digging_into_rocks_with_young_children> Dominguez, L., McDonald, J., Kalajian, K.,& Stafford, K. (2013). Exploring the wild world of wiggly worms. *Science and Children, 51*(4), 44-49. [http://search.proquest.com/docview/14675](http://search.proquest.com/docview/1467533306?pq-origsite=gscholar)[33306?pq-origsite=gscholar](http://search.proquest.com/docview/1467533306?pq-origsite=gscholar)**Note:** This article is available online only at institutions with a license for the journal database.Hoisington, C., Chalufour, I., Winokur, J., & Clark-Chiarelli, N. (2014). Promoting children’s science inquiry and learning through water investigations. *Young Children, 69*(4), 72–79. [https://www.researchgate.net/publication/292147104\_Promoting\_CHildren's\_Science\_Inquiry\_and\_Learning\_through\_Water\_Investigations](https://www.researchgate.net/publication/292147104_Promoting_CHildren%27s_Science_Inquiry_and_Learning_through_Water_Investigations)  | Test Your Knowledge Discussion Board Family TalkGraded Assignment: Graphic Organizer #3Graded Assignment: Revision of Science Activity PlanCORP Feedback |

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|  |  | • Peer Discussion: Articles on teaching science, assessment | Ashbrook, P. (2017, September 8). Documenting science investigations in preschool: Solar eclipse and butterfly metamorphosis. NSTA Blog. <http://nstacommunities.org/blog/2017/09/28/documenting-science-investigations-in-preschool-solar-eclipse-and-butterfly-metamorphosis/>  |  |
| 13 | The Teacher’s Role: Observation and Assessment | Know (Videos and eLearningActivities):• Assessment Instruction cycle• How can teachers learn about children's thinking and learning?• How can teachers collect information on child mathematical thinking?• What to assess?• How to assess: Formative and Summative• How to productively mediate math learning in formal and informal | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 57-59. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Komara, C. & Herron, J. (2012) Implementing formative mathematics assessments in prekindergarten. *Childhood Education, 88*(3), 162-168. [http://www.tandfonline.com/doi/abs/10.108](http://www.tandfonline.com/doi/abs/10.1080/00094056.2012.682548)[0/00094056.2012.682548](http://www.tandfonline.com/doi/abs/10.1080/00094056.2012.682548)**Note:** This article is available only at institutions with a license for the journal database. | Test Your Knowledge Discussion Board Family TalkGraded Assignment: Graphic Organizer #4Graded Assignment: Assessment ChecklistsGraded Assignment: Learning Objectives Based on Assessment |

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|  |  | activitiesSee:• Video observations of teachers and children in the classroomDo:• Family Talk: How might you explain the importance of formative assessment to families? How might you include families in this assessment process?• Graphic organizerReflect:• CORP feedback on peers’ videos from previous session• Peer Discussion: Learning Stories | Pack, J. (2016, December/January). Learning stories. *Teaching Young Children,* *9*(2). <https://www.naeyc.org/resources/pubs/tyc/dec2016/learning-stories>Drummond, T. (2015) Learning Story Examples. Posted to tomdrummond.com. <http://tomdrummond.com/learning-stories/> |  |
| 14 | The Teacher’sRole: Planning | Know (Videos and eLearningActivities):• How can the environment support ongoing math learning?• How can teachers plan for ongoing activities | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 57-59. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)Casey, B., Erkut, S., Ceder, I., & Young, J. M. (2008b). Use of a storytelling context to | Test Your Knowledge Discussion Board Family TalkGraded Assignment: |

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|  |  | and daily routines?• How can planning address the diverse needs of children?• How to plan instruction based on assessment: Activity Matrix• Activity Matrix in ActionSee:• Video observations of teachers and children in the classroomDo:• Family Talk: How might you use the basic concept of the Activity Matrix (skill *x* routines) with families to increase their understanding of cognition, math, and science across the day?• Build an Activity Matrix with provision of the right materials (math)• Build an Activity Matrix for both a cognition activity and a science activity | improve girls’ and boys’ geometry skills in kindergarten. *Journal of Applied Developmental Psychology, 29*(1), 29–48. [http://www.sciencedirect.com/science/articl e/pii/S0193397307001256](http://www.sciencedirect.com/science/article/pii/S0193397307001256)**Note:** This article is available only at institutions with a license for the journal database. | Building a Math ActivityMatrixGraded Assignment: Math Activity Matrix – Providing the Right MaterialsGraded Assignment: Cognition and Science Activity Matrices |

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|  |  | Reflect:• N/A |  |  |
| **15 Final** | **Bringing It****All Together** | Know, Do, Reflect:• Self-Regulated Learning Log progress, updates and adjustments, reflection• Video selection, analysis, interpretation• Planning for ongoing practice (goal setting guides, final graphic organizer)• Video explanation of final graphic organizer• CORP feedback on video of final graphic organizer | HHS/ACF/OHS. (2015). *Head Start Early Learning Outcomes Framework*, 50-65. [http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/appr oach/pdf/ohs-framework.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/hs/sr/approach/pdf/ohs-framework.pdf)HHS/ACF/OHS. (2014). *Understanding goals, objectives, outcomes, progress, and action plans* (Foundations for Excellence: Planning in Head Start: Topic #1), 4-8. [http://eclkc.ohs.acf.hhs.gov/hslc/tta- system/operations/docs/planning-topic-](http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/operations/docs/planning-topic-1.pdf)[1.pdf](http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/operations/docs/planning-topic-1.pdf) | **Final Assignments #1 –****#5** |