Building a Science Community

SY 22-23

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Building a Science Community SY 22-23

For our implementation of the College and Career Ready Standards for Science, it is important to begin by laying the foundational skills students need to engage in active science investigations. These routines and procedures should be introduced within the context of simple, yet engaging activities as you start Building a Science Community. ***If you are new to DoDEA K-5 Science please click here for the*** *New Teacher Overview.*

IMPORTANT UPDATE: FOSSWeb is located on the platform called ThinkLink. It will be accessed through Classlink. The ThinkLink Knowledge Hub has information to support this transition including:

- Getting Started with FOSS on ThinkLink
- FOSS on ThinkLink Tour
- Navigating Your Teacher Dashboard
- Navigating Your Student Dashboard
- Where do I find…? For Teachers
- Where do I find…? For Students
- How should FOSS students interact with the site

Please contact your district PK-5 Science ISS for assistance with FOSS on ThinkLink.

1. ***Student Activity:*** *Prepare students to use the new FOSS platform called ThinkLink. Model and practice with students how to access FOSS through ThinkLink within Classlink and how to navigate features such as the student ebook, multimedia resources, tutorials, and virtual investigations. This will be very important to do within the first week of school in case the pandemic situation requires a return to remote learning in the future.*

2. Safety
   - The safety icon in the Teacher Investigation Guide indicates possible issues related to allergies, chemicals, and science equipment.
   - ***Student Activity:*** *Model the use of the safety and science equipment (goggles, hand lens, balances, etc.) and introduce the FOSS Safety Poster (found in drawer 1 of each grade-level kit and on ThinkLink under Module Resources - Materials and Kit Information - Posters and Card Sets).*
   - Check your class allergy list with this FOSS list for any possible concerns (gluten/legume alternatives).
   - Review the FOSS Safety Data Sheets. These should be printed and put in Drawer 1 of the kit.
   - In 2019, safety goggles for all K-5 teachers and students were purchased for each school. The DoDEA K-5 Science Safety Information outlines goggle use, storage, cleaning, and sanitation.

3. Social and Emotional Learning (SEL)
   Social and Emotional Learning is a deeply ingrained part of the way students and adults interact both in the classroom and out of it, and helps provide children with equitable, supportive, and welcoming learning environments. Social and Emotional Learning will be especially important during this pandemic. Please take time during the Building the Community days for creating a collaborative, supportive learning community. Please check with your school counselor for more ideas/suggestions/websites.

4. ***Student Activities:***
   Observation Practice: In preparation for scientific observations, display an interesting photo of an animal in a habitat (Example: cat in a yard) and ask students to record and share their observations and questions. Sentence stems such as "I observe," "I notice" and "I wonder" may be helpful. This provides an opportunity

to practice the CCRSS Science and Engineering Practices of Planning & Carrying Out Investigations (observations) and Asking Questions.
Sense-Making Discussion Practice: A simple activity (such as a picture observation) should be conducted to give students evidence to discuss. The goal of sense-making discussions is to analyze data, extract meaning, and for students to organize and communicate their thinking.

- *One resource to support engaging in argumentation with evidence is Exemplar Evidence: Scientist and Their Data. (check with your information specialist for local availability)*
- *While building a community, students should learn the expectations for listening to each other.*
- *Teachers should use prompts and questions to encourage students to provide evidence-based responses. Use the Talk Moves to help promote discourse.*
- *Use the FOSS Sense-making Posters to introduce sentence stems to teach students how to have meaningful science discourse. Communication Starter posters were adapted from the sentence stems introduced at the FOSS professional learning to be applicable for all subjects and are posted in your grade-level Communities of Practice (Resources-->CCRS & Content Sequence--->Integration Resources--->Communication Starters).*
- *Remote Learning Technology Tools- Introduce technology tools you might use for remote sense-making discussion such as Google Meet (chatbox), Google Jamboard, Padlet, etc.*

5. Planning for Sense-Making Discussions
   Sense-Making Discussions encourage students to become scientifically literate citizens. FOSS provides information regarding K-2 Science-Centered Language Development and 3-5 Science Centered Language Development in the Teacher Resource book/ThinkLink. The section includes helpful information for planning during Sense-Making Discussions and information about reinforcing science vocabulary in context and not in isolation.
   - When you begin Life Science, utilize the grade-level specific Sense-Making Discussion section from ThinkLink and the Sense-Making Discussion Planning Template. To access your grade level's Sense-Making Discussion chapter within ThinkLink, click Grade-level and NGSS Resources --> NGSS Three-Dimensional Learning --> Sense-Making in Three-Dimensions --> Sense-Making Discussions in Three-Dimensional Learning:
     - Kindergarten
     - First Grade
     - Second Grade
     - Third Grade
     - Fourth Grade
     - Fifth Grade
   - For an additional resource to help teachers prepare to lead Sense-Making discussions, check out the video introduction to the Talk Science Pathway in the Inquiry Project.

6. Grade Level Planning Guides from ThinkLink
   - Kindergarten
   - First Grade
   - Second Grade
   - Third Grade
   - Fourth Grade
   - Fifth Grade

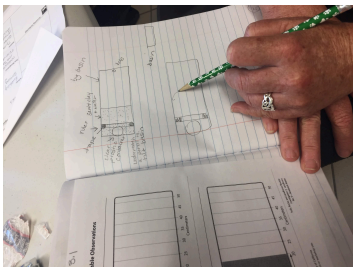
7. Planning for the Life Science Investigations
   - Read the Life Science Investigation Guide and watch the Teacher Prep Videos on ThinkLink.
   - If in remote learning, utilize the DoDEA Remote Learning website which includes photos and videos of live specimens, sample lessons modified for remote learning, and additional resources.

8. ***Student Activity:*** *With your students, set up the habitats for the upcoming Life Science investigations. Visual materials list for each grade level investigation can be found here - Visual Materials List. The equipment cards can be helpful for identifying the materials needed. The drawer inventory list is located in drawer one and in the Schoology Communities of Practices. The drawer numbers printed in the*

Investigation Guide do not match our materials because DoDEA purchased the Grade-Level Kit configuration to reduce the number of drawers in each kit. As a class, develop live organism care plans. (Crayfish Sample - Prep and Care by Students) If in remote learning, photos and videos of live organisms can be used to support investigations.

9. Print/Prep: Letter to the Family & Home-School Connections
   - Kindergarten - *Animals Two By Two*
   - First Grade - *Plants and Animals*
   - Second Grade - *Insects and Plants*
   - Third Grade - *Structures of Life*
   - Fourth Grade - *Environments*
   - Fifth Grade - *Living Systems*

10. ***Student Activity:*** *Introduce and set up Science Notebooks. FOSS provides guidance to help you get started. See Grades K-2 Science Notebooks and/or Grades 3-5 Science Notebooks for more information.*
    - *Find a real world example [click the "Getting Started" tab] of a scientist's notebook to discuss with students OR read Notable Notebooks: Scientists and their Writings to emphasize how scientists and engineers use notebooks in their work. (check with your information specialist for local availability)*
    - *Guide students to set up the organizational features of their notebook.* Recommendation - Composition books give students more ownership over their notebooks and allow a more authentic approach than teacher created packets or versions available at Teachers Pay Teachers.



11. Taking FOSS Outdoors
    - Review the Taking FOSS Outdoors chapter and plan for the Outdoor Learning Experiences.
    - Introduce the Outdoor Safety Poster (found in drawer 1 of each grade-level kit and on ThinkLink under Module Resources --> Materials and Kit Information --> Posters and Card Sets).
    - ***Student Activity:*** *Make an outdoor bag (options are described in the Teacher Resources book/ThinkLink). Take students outside to make and record observations in their science notebooks (possible prompts: living versus non-living, man-made versus natural, evidence of living things, etc.). Use this experience to establish the rules and routines with Taking FOSS Outdoors (exit out a non-recess door, boundaries, identifying a standard meeting spot, whistle/signal, etc.). Follow up with a Sense-Making Discussion about students' observations of the outdoor environment.*

Frequently Asked Questions

- **If the Health Protection Condition changes and we go to remote learning, how can the FOSS lessons be adapted?**

  Answer: Designing your FOSS Instruction is a resource developed by the authors of the FOSS program to support instruction. A Module Navigation Matrix has been developed for each module to provide guidance on in-person socially-distanced learning and asynchronous and synchronous remote learning. Even in remote learning it is fundamental for CCRSS that students engage in science investigations just like scientists. The elementary science ISS team has prepared a website to help with remote learning should it be necessary. The DoDEA Elementary Remote Learning Resources website includes examples on how to adapt FOSS lessons, photos and videos of live organisms that can be used in remote learning, reference documents, and best practice videos. The FOSS team has recorded webinars from 2020 to support teachers in planning for remote learning and physical distancing.

- Where can I find the scope and sequence for science?

Answer: The DoDEA CCRSS Scope and Sequence By Quarters can also be found in the Schoology Communities of Practice. Everyone will begin by Building a Science Community, move into Life Science, followed by Physical Science, and then Earth & Space Science. Exact dates of the live organism shipments are specific to each school/district location. Your district ISS will provide more detailed information.

- Are there parent guides available to share with families?
  Answer: Yes, there are two guides, one for PK-2 and one for 3-5. An interactive e-book guide is available to help families navigate this online resource.

- How should I display the learning objectives for my science lessons?
  Answer: The guiding question, provided for each Investigation, and focus question for each part of each investigation (found in the Overview - Module Matrix) can be used as is for the learning objective or modified into an "I Can.." statement. The Investigation Guide highlights the three dimensional learning that is part of each lesson. Every investigation includes at least one Science and Engineering Practice, Crosscutting Concept, and Disciplinary Core Idea. Color-coded highlights are included in the Investigation Guide to draw attention to three-dimensional elements of CCRSS to assist teachers in intentionally addressing the standards and explicitly referencing them with students.

- How does Science connect with other disciplines and skills taught across other subject areas?
  Answer: Work with your colleagues (grade-level team, district ISS, administrators, Community of Practice, etc.) to collaborate about opportunities for students to transfer skills between science, literacy, math, and social studies. Possible resources include the following:

DoDEA CCRS & Content Sequence	**FOSS & CCRSL**	**FOSS & CCRSM**
• Kindergarten	• Kindergarten	• Kindergarten
• First Grade	• First Grade	• First Grade
• Second Grade	• Second Grade	• Second Grade
• Third Grade	• Third Grade	• Third Grade
• Fourth Grade	• Fourth Grade	• Fourth Grade
• Fifth Grade	• Fifth Grade	• Fifth Grade

- Will there be more professional learning opportunities this year?
  Answer: Yes, K-5 teachers of science will be given the opportunity to participate in Collaborative Planning Days. Contact your ISS for more information.

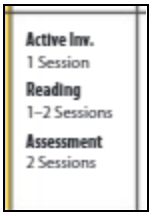
- Why is my Investigation Guide different from the resources that I find on ThinkLink?
  Answer: FOSS is continually updating the resources available on ThinkLink. The PDF-based Investigation Guide on ThinkLink is always the most up-to-date version. The Assessment Chapter on ThinkLink and the assessments on FOSSmap will also be the latest versions, and may differ from the paper copies provided in your Teacher Resource book.
  Note: The step numbers on the Module Navigation Matrix match the PDF-based Investigation guide on ThinkLink and may not always match the steps in your print Investigation Guide.

- How do I know the alignment of the lessons with the standards?
  Answer: The FOSS program was designed for the Next Generation Science Standards, which are DoDEA's College and Career Ready Standards for Science (CCRSS). The three dimensions of the

standards are highlighted throughout the Investigation Guide. Science and Engineering Practices are always blue, Crosscutting Concepts are always green, and Disciplinary Core Ideas are always orange. Look at the Framework and NGSS section for more information about instruction and look at the Assessment section for information about how to evaluate student progress on the standards. Each investigation builds upon the previous one and the grade levels build upon one another. It is important to proceed through the investigation as designed to avoid creating any gaps in student knowledge. Any similarities in activities in different grade levels is an intentional part of the program to allow students to utilize prior knowledge as they explore the concepts with greater depth.

- How do I plan for the module?

  Answer: The Scheduling the Module charts in the Overview section provides recommendations for how to plan the unit. Active Investigations are labeled with an A, Reading activities are labeled with a R, Warm-up and Wrap-up activities are labeled with W, and I-Check assessment opportunities are also shown. Sometimes there may be overlap in the investigations as the students are waiting for the plants or animals to grow and develop. The "At a Glance" pages for each investigation give recommendations about the number of sessions to plan for each part of the investigation.



Week	Day 1	Day 2	Day 3	Day 4	Day 5
	Survey	(Dry soil)			
1	START Inv. 1 Part 1 A (mealworms)	R/W	START Inv. 1 Part 2 A/R	A/R	A
2	A/W	START Inv. 1 Part 3 A/R	R	R/Review	(Start aging water) I-Check 1
3	(Observe mealworms) Self-assess	START Inv. 2 Part 1 A	A/R/W	START Inv. 2 Part 2 A	A/R
4	(Test shrimp eggs) R/W	START Inv. 2 Part 3 A/R	R/W	START Inv. 2 Part 4 A	A/R
5	R	Review	I-Check 2	Self-assess	(Observe mealworms)
6	START Inv. 3 Part 1 A/W	START Inv. 3 Part 2 A	A/R	A/R/W	START Inv. 3 Part 3 A
7	(Dry soil) A/R/W	START Inv. 3 Part 4 A/R	Review	START Inv. 4 Part 1 A (planting)	I-Check 3
8	Self-assess 3	(Day 5 observe) A/R	R/W	START Inv. 4 Part 2 A	(Day 8 observe) A/R/W
9	START Inv. 4 Part 3 A	("Darkling Beetles") R	(Day 13 observe) A	Review	Posttest

- If we are in remote learning, how should the standards be addressed?

  Answer: For Science, the three dimensions of CCRSS (Science & Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas) should be addressed regardless of the modality (in-person learning, remote learning, or virtual learning) following DoDEA's Scope & Sequence.

  Here are some examples how to engage the students in the **Science & Engineering Practices** (SEPs) during remote learning:

  - **Asking Questions**- encourage students to ask questions during synchronous and asynchronous discussions
  - **Developing & Using Models**- using technology tools (Wixie, Google Draw, FOSSweb multimedia activities, etc.) students can create a model of a phenomenon
  - **Planning & Carrying Out Investigations**- students can make observations using photos and videos and/or in the local environment and record their observations in their science notebook; on FOSSweb conduct virtual investigations
  - **Analyzing & Interpreting Data**- students can compare predictions and actual observations or compare data from different students observations and discuss
  - **Using Mathematics & Computational Thinking**- students can asynchronously compare data to look for patterns or relationships and then discuss their findings during synchronous sessions
  - **Constructing Explanations**- students can use evidence from observations to construct explanations; students use words and drawings to explain their thinking
  - **Engaging in Argument From Evidence**- students can asynchronously construct an argument with evidence to support a claim and then share their evidence/claim in a synchronous session
  - **Obtaining, Evaluating, & Communicating Information**- students can obtain information from text or video to explain a phenomenon; students can communicate their understanding during sense-making discussions synchronously and/or asynchronously