Baylor College of Medicine

CENTER FOR EDUCATIONAL OUTREACH

UNT

INTERDEPENDENCE AMONG ORGANISMS

SPRING 2021

Orientation Agenda

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Overview of the project

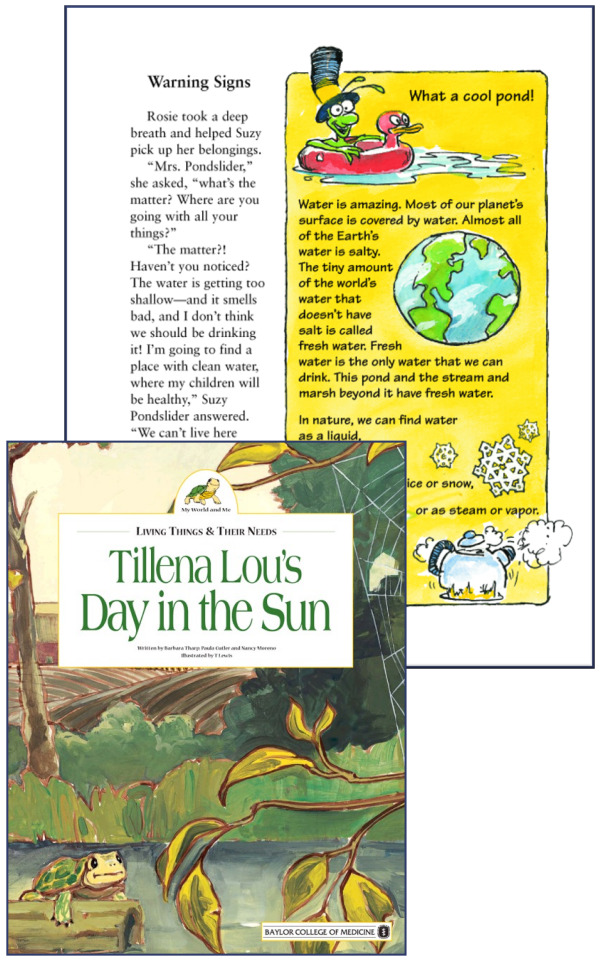
Descriptions of the activities

Timeline and data collection procedures

I’m taking an innovative approach to teaching this semester. I’m using books!”

Cross curricular links to Reading Contributes to…

- Learning of targeted science concepts, especially among Spanish-speaking students,
- Greater rate of improvement in science achievement scores among Hispanic students (tests administered in English),
- English vocabulary development and appropriate use in writing samples by all students (increased correct use of science vocabulary words and numbers of “if/then” statements).



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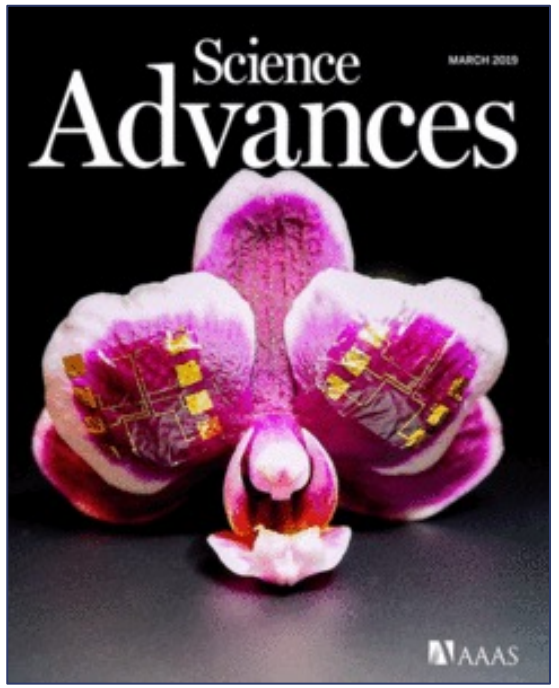
What Do Scientists Read?



Literacy in Science Is Unique

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- Technical terms known only to members of the group.
- Extensive noun phrases that convey large amounts of information.

  They generated a suite of forest canopy functional trait maps from laser-guided imaging spectroscopy... (*Science* 355: 363)
- Information flows and is cross-referenced.

  This remarkable diversity... (metaphor summarizes previous text)
- Includes reasoned arguments.
- Extensive use of visual representations (figures, tables, graphs, charts, maps, photographs) and symbols.
- Scientists ("experts") approach and read a paper differently from novices.

Fang, Z. 2012. Language Correlates of Disciplinary Literacy. *Topics in Language Disorders* 32:19-34.

At the heart of what makes this model different...disciplinary literacy

- **Disciplinary literacy.** The specialized information and organizational patterns, language, vocabulary, syntax, text features, and ways of interpreting, evaluating, and conveying evidence and information within a particular discipline. An approach that identifies and teaches the specialized reading and writing skills, text features, and foci needed to successfully comprehend material in a particular discipline.

ILA (ND). Literacy Glossary. Downloaded from https://www.literacyworldwide.org/get-resources/literacy-glossary

Science Language Learning

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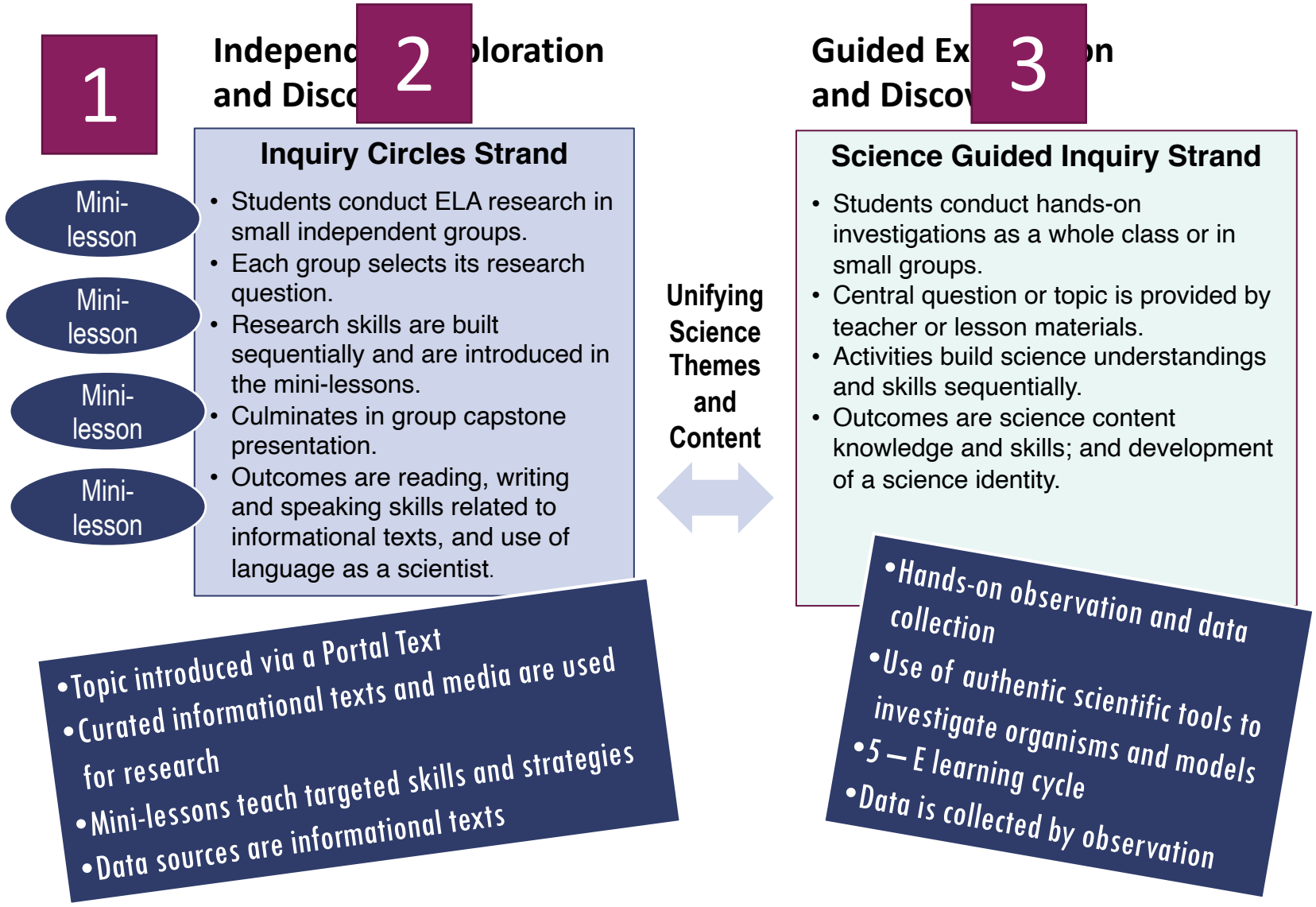
ACTIVITIES

Overview of Each Day

Each day consists of three sections:

- A whole group mini-lesson that focuses on a science-specific disciplinary literacy strategy
- Small, guided inquiry circle groups in which learners practice and apply their science-specific disciplinary literacy strategies to their own research
- A whole class, teacher-facilitated science inquiry activity.


1
Mini-lesson
Mini-lesson
Mini-lesson
Mini-lesson
2
Inquiry Circles Strand
• Students conduct ELA research in small independent groups.
• Each group selects its research question.
• Research skills are built sequentially and are introduced in the mini-lessons.
• Culminates in group capstone presentation.
• Outcomes are reading, writing and speaking skills related to informational texts, and use of language as a scientist.
•Topic introduced via a Portal Text
•Curated informational texts and media are used for research
•Mini-lessons teach targeted skills and strategies
•Data sources are informational texts
Unifying Science Themes and Content
3
Science Guided Inquiry Strand
• Students conduct hands-on investigations as a whole class or in small groups.
• Central question or topic is provided by teacher or lesson materials.
• Activities build science understandings and skills sequentially.
• Outcomes are science content knowledge and skills; and development of a science identity.
•Hands-on observation and data collection
•Use of authentic scientific tools to investigate organisms and models
•5 – E learning cycle
•Data is collected by observation

Mini-lesson Overview

- Intentional instruction
- Three sections of each mini-lesson
- Modeling the mini-lesson
- Anchor charts
- Daily strategy reminders

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Intentional Instruction

Teachers provide opportunities for readers to engage in science-specific disciplinary literacy strategies

Think aloud of teachers' processing use of metalanguage supports the development of metacognition

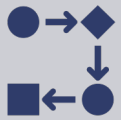
Three Sections of the Mini-lessons

- Declarative: what the science-specific disciplinary literacy strategy is
- Conditional: when to employ the science-specific disciplinary literacy strategy is and why it is important
- Procedural: cognitive processing behind the science-specific disciplinary literacy strategy

Note: the terms *declarative*, *conditional*, and *procedural* are meant for teachers, not students.

Modeling the Mini-lesson

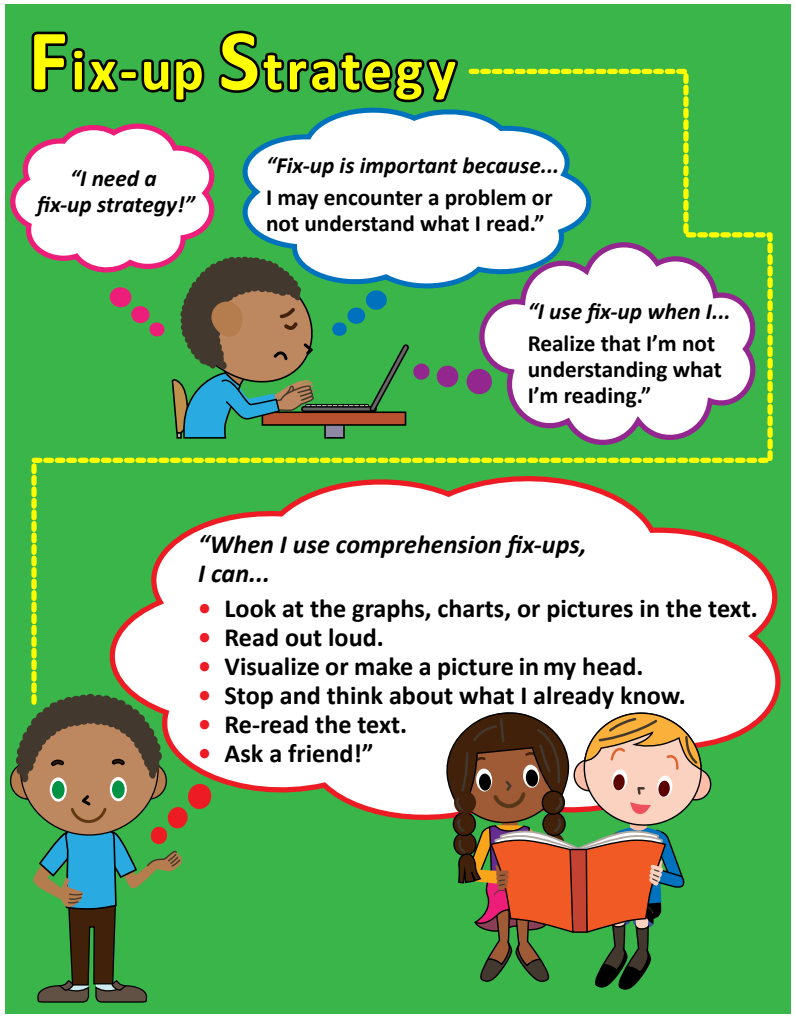
Model the science-specific disciplinary literacy strategy using one of the texts about the backyard organisms (see list in web resources)



Learners will take what you have demonstrated and will apply it to their inquiry circles.

Anchor Charts

- Sample anchor charts have been provided.
- These anchor charts are intended to be developed *with your learners.*



Day 12

Daily science-specific disciplinary literacy strategy Reminders

Each mini-lesson contains this image that serves as a reminder of science-specific disciplinary literacy strategy that students should be encouraged to use throughout the unit.

Inquiry Circle Groups Overview

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- Grouping (can use existing groups or create new groups)
- Choosing a topic from list of recommended organisms (on website)
- Portal texts (list on website)
- Collecting information
- Recording information
- Helpful organization tips
- Culminating product

GROUPING

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- Learners may work in groups you have already formed in your classroom.
- Or, grouping can be based on students':
  - Shared interest in a topic
  - Prior knowledge or experience with a topic
  - Motivation to work independently
  - Diverse perspectives
- Learners may be in the same inquiry circle groups as their science inquiry groups, or you may choose to reassign groups.

CHOOSING TOPICS

LEARNERS ARE ENCOURAGED TO CHOOSE THEIR ORGANISM TO RESEARCH.

* RESOURCES AND SUGGESTED ORGANISMS ARE ON THE PROJECT WEBSITE....

Portal Texts

Once the groups have chosen their topic (organism of interest), you will read a portal text.

A list of sample portal texts can be found on the project website, or you may choose others.

A portal text is an engaging, fictional text designed to grab the attention and spark the interest of your learners.

Portal texts can be read by learners in their inquiry circle groups prior to starting the research, or you may choose to read the portal texts during your class read aloud time.

SMALL GROUP INVESTIGATIONS

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- Students will engage in small group investigations about their organism of choice using a variety of informational texts.
- We have provided a list of possible expository texts, websites, and online books, or you may find other resources you wish to make available.
- If you wish to include different expository texts, please look for a variety of text features, appropriate reading level, current and accurate information, and colorful photos or scientific illustrations.

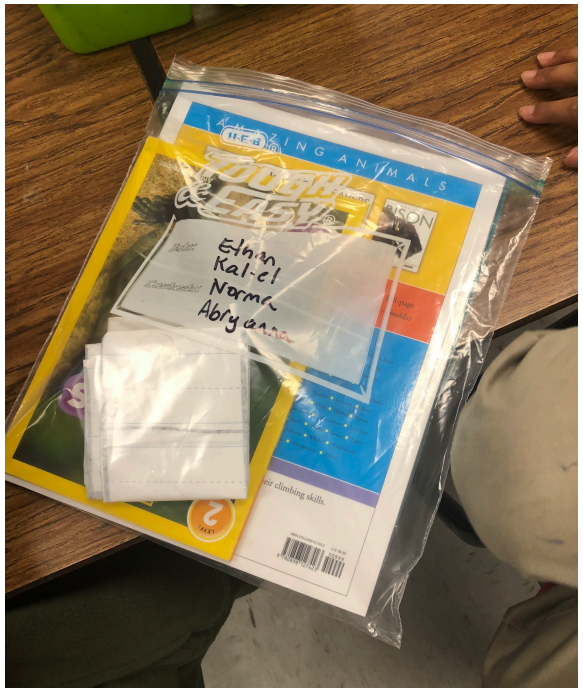
INQUIRY CHARTS

- An inquiry chart is a text-based way to record and organize information that learners discover about their topic, as well as the sources they used.
- The information in the chart will guide learners as they research, summarize, synthesize, and create a culminating project.

Name of Animal and Group Members Here	What is the life cycle of a penguin?	What are the physical traits of the adult?	What are the physical traits of the offspring?	How do the physical traits of the offspring compare to the adult?	How do the physical traits help them survive?	Other Interesting facts
What We Know						
Resource 1 Record the title, author, website, here.						
Resource 2 Record the title, author, website, here.						
Resource 3 Record the title, author, website, here.						
Resource 4 Record the title, author, website, here.						

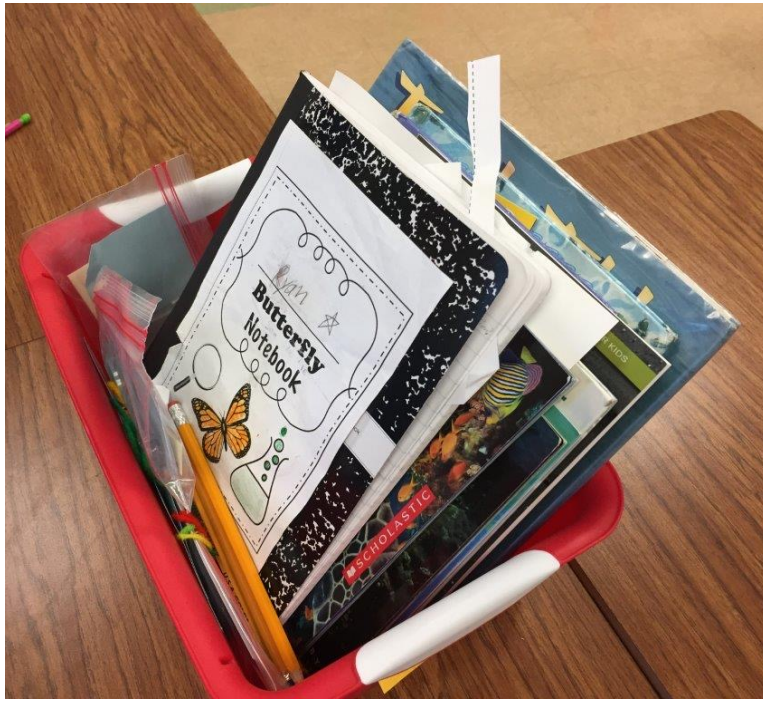
Helpful Organization Tips

Books and inquiry charts for each inquiry circle group can be stored in a gallon-size ziplock bag.



Helpful Organization Tips

Books, inquiry charts, and student notebooks can be stored in a basket or bin.

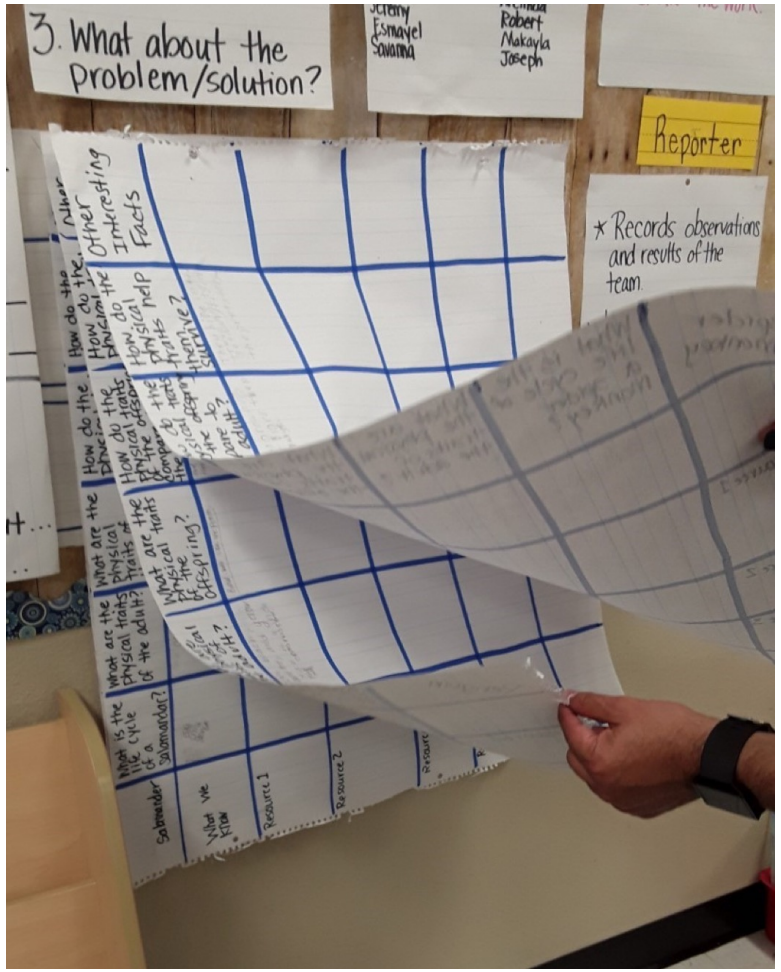


Helpful Organization Tips

Open-faced bookshelves can be used to organize and display the informational texts for each inquiry circle group.

Helpful Organization Tips

Inquiry charts can be posted to a bulletin board and retrieved when students break into their inquiry circle groups.



Culminating Activity

Inquiry circle groups can create and present a product to share what they have learned.

Inquiry Circle Menu of Choices

- Choose an option from the choices below to show what you know!
- Be sure your project shows what you know about your organism's physical traits in adults and offspring.

 Write one-page report about what you learned. Be sure to use your own words!	 Make an art project (painting, sculpture, etc.) and explain the project in writing.	 Create and perform a song about the animal you researched.
 Bring a photograph to life with the Chatterpix app!	 Write a poem about the animal you researched.	 Write and act out a news story.
 Create a display board and living wax museum.	 Create a shoebox diorama.	 Make an image come to life with ThingLink!
 Create a green screen puppet show using an app like Doink.	 Create an animated video using the Tellagami!	 Create a graphic organizer of what you've learned with the Poppet Lite App.
 Write and perform a short skit.	 Create a collage.	 Do you have an idea not listed here? Check with your teacher to see if it's okay.

Inquiry Circle Menu of Choices

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Science Investigations

Overview

The sequence of lessons in this unit are designed to build skills in the practices of science and to develop science content understanding as students embody the role of scientists.

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Essential Questions:

- What is interdependence?
- Why do living things depend on each other?
- Why is the environment important to living things?
- What is the role of decomposers in an ecosystem?

Students will:

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Understand:

- Living things cannot survive by themselves
- Living things depend on their environment and each other

Know:

- An organisms' needs are met in the specific environment in which they live
- Organisms interact with other organisms and the environment to meet those needs

Be able to:

- Give examples of how living things depend on each other
- Describe how the natural world provides what organisms need.
- Describe a simple food chain
- Identify/describe the role of decomposers in a food chain
- Identify living/non-living components in an environment

Science Investigation

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We will use pill bugs (decomposers) to:

- Develop a question to investigate
- Plan and conduct a simple investigation
- Make observations and collect/organize data
- Communicate observations
- Make a claim and provide evidence to dispute or support the claim using authentic data

Lessons Overview

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- Each lesson begins with an overview of what students will be doing that day. Guiding questions are provided.
- Background information related to the lesson is provided **for the teacher**.
- Materials lists and instructions for set up are provided. You will receive the materials needed for conducting the lessons, as well as all digital resources.
- Safety rules point out potential hazards

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- Lessons are structured in a 5 E format.
- Please read over each lesson ahead of time! Some will require set ups that must be done before the lesson.
- You will receive a voucher to purchase live pill bugs from Carolina Biological. Order them with plenty of time to begin the unit.
- The class pill bug habitat must be prepared to present to the class on Day 2. (See Setting Up Habitat docx.)
- Pill Bug Investigation Journals are used to document observations.
- TEKS and NGSS Standards are provided for each lesson.

Lesson Summaries

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- **Day 1 - I Am a Scientist** - Work in a team (assigned by the teacher) to solve a problem. Prepare snails before the class- a video is provided to show how to make one!
- **Day 2- Roly-polys**! -Introduce the pill bug habitat to the class.
- **Day 3 - What Do Roly-polys Need?** Students learn basic facts about pill bugs. Prepare to project the slideshow or create a flip book before the class.
- **Day 4 - What Do Pill Bugs eat?** – Students develop a question to investigate with guidance from the teacher (they will pick the foods to use). Important not to reveal what pill bugs really eat!
- **Day 5 - How Do We Set Up an Investigation?** – Team pill bug habitats must be set up by the teacher before class today! Students will move pill bugs into the habitat today (but not the food). Print Pill Bug Investigation journals before the class and instruct them on how to use them.

- **Day 6 - What Kind of Information Will I Collect?** – Teacher must pre-cut food choices selected for the investigation (teacher provides); take pictures of the food in each habitat! Students make first observations. Observations will be conducted for 5 days beginning today.
- **Day 7 - Why Do Living Things Need Each Other?** – Learning about interdependence through a reading of "A Logs Life".
- **Day 8 - What Are Ecosystems?** – A slideshow of different environments is used for a discussion of living/non-living components in an environment and introduces the concept of an ecosystem.
- **Day 9 - Eating Out in the Garden** – An interactive game teaches the concept of food chains. Print out "Eating Out in the Garden" images and script.
- **Day 10 - Nature's Recyclers: Decomposers** - Students examine garden litter (dry leaves, pieces of bark, dead plants, etc.) to learn about decomposition. Gather garden litter before the class, organize materials for investigation and print student handout.
- **This is the last day for observations of the pill bugs. Take a picture of what the food looks like today**!

- **Day 11- Going on a D-Hunt** – Students conduct an outdoor scavenger hunt to find evidence of decomposition/decomposers. Teacher will pre-select a safe place for the hunt. Print handouts and prepare materials.
- **Day 12 - What is Scientific Evidence?** – Students learn about claims and evidence using a modified Claims, Evidence, Reasoning,(CER) approach. Prepare materials.
- **Day 13 - Preparing the Science Presentation Part 1-** Students prepare to present what they have learned in a “live interview” (culminating activity). Today they prepare their team CER chart. Prepare materials.
- **Day 14 - Preparing the Science Presentation Part 2** – Students practice for their “live Interview”. Prepare materials.
- **Day 15- Live from the Classroom**! Prepare materials. Take pictures or a video to share!!!

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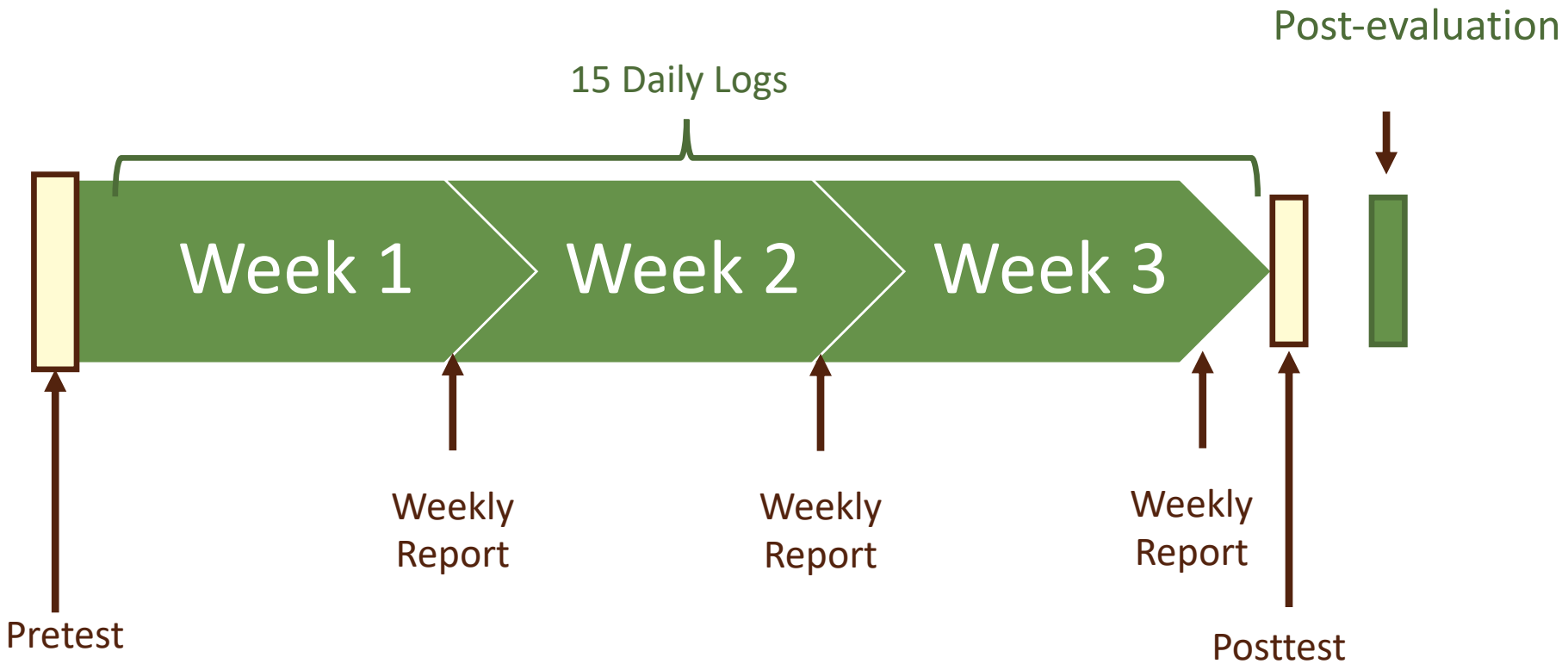
INTERDEPENDENCE AMONG ORGANISMS

TIMELINE AND DATA COLLECTION

TIMELINE

- Choose 15 consecutive classroom days to teach the lessons (April 22 - June 4)



Timeline, Continued

SUN	MON	TUE	WED	THU	FRI	SAT
18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr Pick up	24-Apr
25-Apr	26-Apr 1 Start	27-Apr	28-Apr	29-Apr	30-Apr	1-May
2-May	3-May	4-May	5-May	6-May	7-May	8-May
9-May	10-May	11-May	12-May	13-May	14-May	15-May
16-May	17-May	18-May	19-May	20-May	21-May	22-May
23-May	24-May	25-May	26-May	27-May	28-May	29-May
30-May	31-May	1-Jun	2-Jun	3-Jun	4-Jun Last day	5-Jun
6-Jun	7-Jun Evaluate	8-Jun	9-Jun	10-Jun	11-Jun All due	12-Jun

Material Pick-up day

First day to start

Last day to start

Final day to end unit

Online evaluations

FedEx envelopes sent

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TIMELINE, CONTINUED

SUN	MON	TUE	WED	THU	FRI	SAT
18-Apr	19-Apr	20-Apr	21-Apr Pick up	22-Apr	23-Apr	24-Apr
25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr	1-May
2-May	Pretest Log	4-May Log	5-May Log	6-May Log	Report 1 Log	8-May
9-May	10-May Log	11-May Log	12-May Log	13-May Log	Report 2 Log	15-May
16-May	17-May Log	18-May Log	19-May Log	20-May Log	Report 3 Posttest Log	22-May
23-May	24-May	25-May	26-May	27-May	28-May	29-May
30-May	31-May	1-Jun	2-Jun	3-Jun	4-Jun	5-Jun
6-Jun	7-Jun Post-evaluation	8-Jun	9-Jun	10-Jun	11-Jun All due	12-Jun

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Timeline, reviewed

1. Pick up materials and your binder
2. Select your 15-day period
3. Pretest
4. Daily
   - Teach lessons AND complete online log
5. Once a week
   - Student reports
6. Posttest
7. Send forms back to BCM
8. Complete the post-evaluation

Materials Pick up
April 23rd, 12:30-4:30pm

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- Project Binder
  - FedEx Info (Return slip, Envelope, Shipping label)
  - Student pretests
  - Weekly Reports
  - Student posttests
- Materials Kits
  - Student pages
  - Activity materials for student independent work
- Lessons
  - Will be on project website (link in your binder)

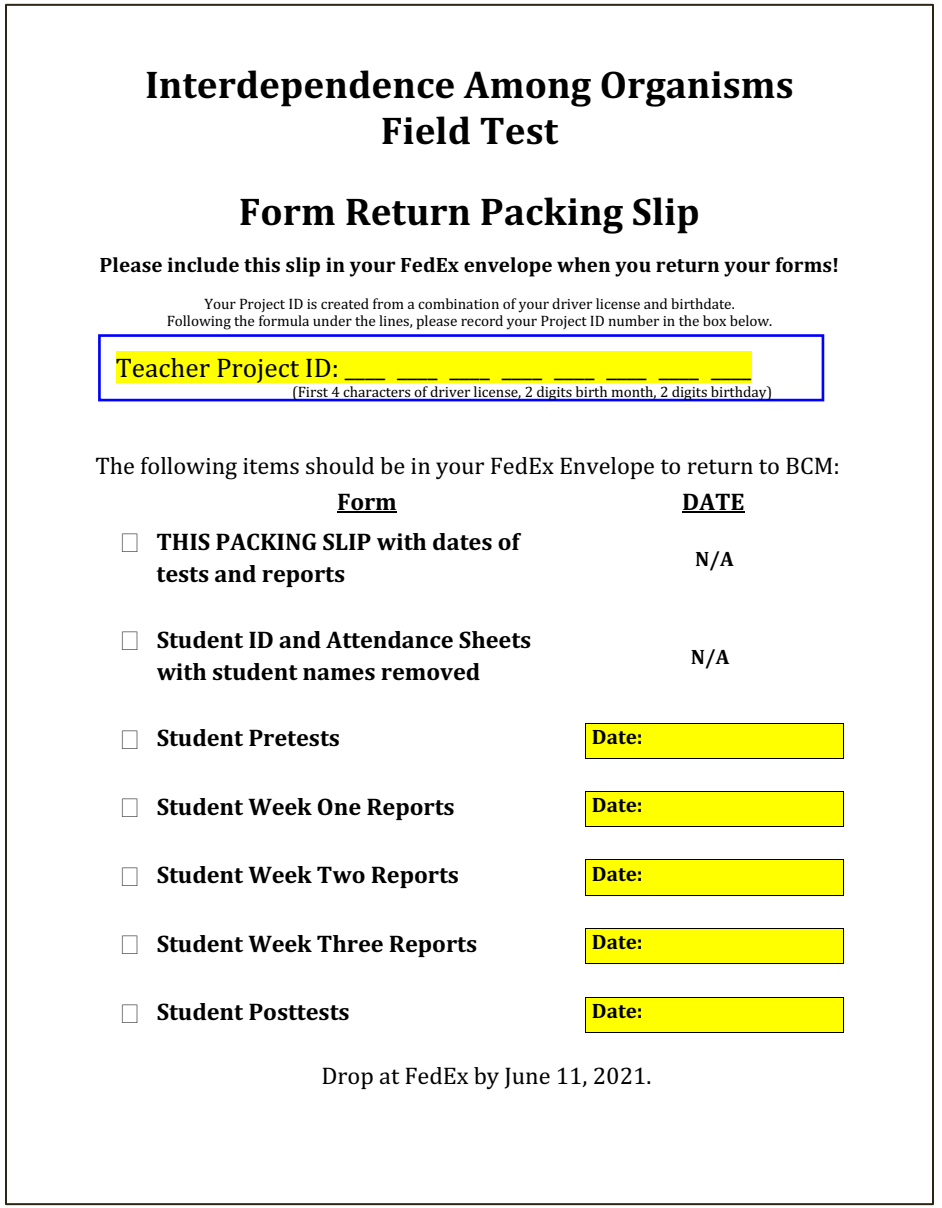
Location:
J.P. McGovern Campus
2450 Holcombe Blvd.,
Houston 77021

At materials pick up, you will be asked to complete your stipend form!

PROJECT ID

- Combination of:
  - 1st 4-digits of your driver's license +
  - 2-digit birth month +
  - 2-digit birth day

- Record on Return Packing Slip and stipend invoice



Interdependence Among Organisms
Field Test

Form Return Packing Slip

Please include this slip in your FedEx envelope when you return your forms!

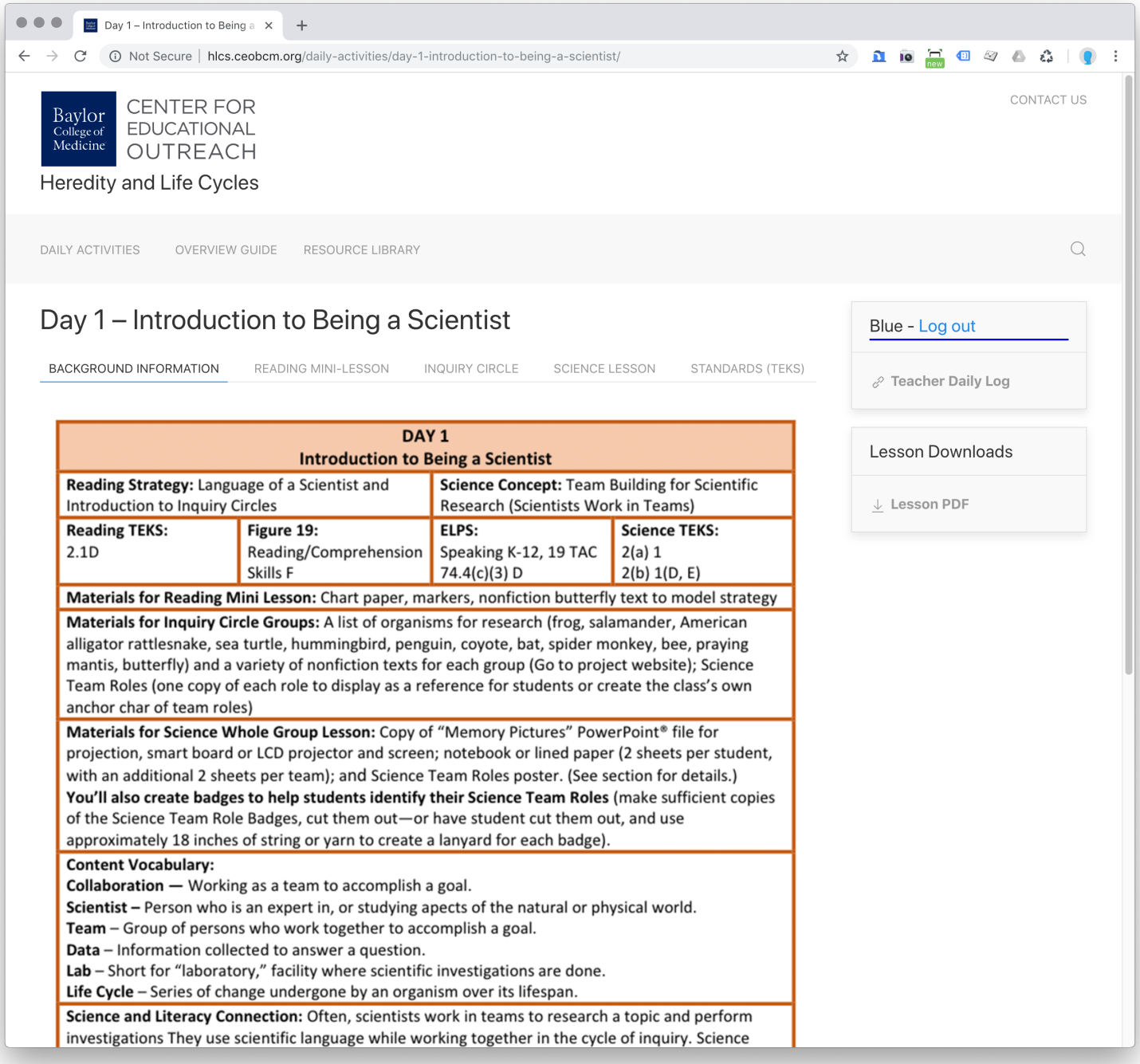
Your Project ID is created from a combination of your driver license and birthdate.
Following the formula under the lines, please record your Project ID number in the box below.

Teacher Project ID: ___ ___ ___ ___ ___ ___ ___ ___
(First 4 characters of driver license, 2 digits birth month, 2 digits birthday)

The following items should be in your FedEx Envelope to return to BCM:

Form	DATE
☐ THIS PACKING SLIP with dates of tests and reports	N/A
☐ Student ID and Attendance Sheets with student names removed	N/A
☐ Student Pretests	Date:
☐ Student Week One Reports	Date:
☐ Student Week Two Reports	Date:
☐ Student Week Three Reports	Date:
☐ Student Posttests	Date:

Drop at FedEx by June 11, 2021.



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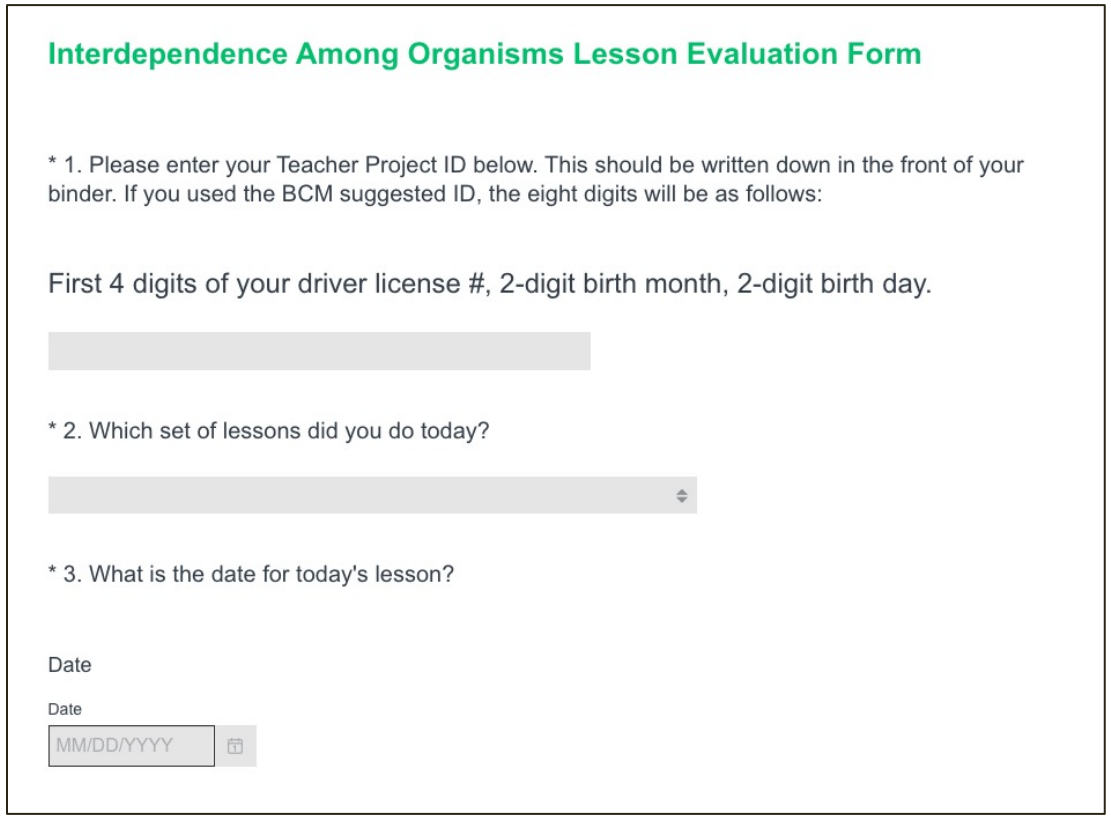
Website

- URL will be in your binder
- Lists of texts and organism resources
- Digital versions of student handouts
- Links to teacher logs and evaluations

Daily Logs



Interdependence Among Organisms Lesson Evaluation Form

* 1. Please enter your Teacher Project ID below. This should be written down in the front of your binder. If you used the BCM suggested ID, the eight digits will be as follows:

First 4 digits of your driver license #, 2-digit birth month, 2-digit birth day.

* 2. Which set of lessons did you do today?

* 3. What is the date for today's lesson?

Date

Date

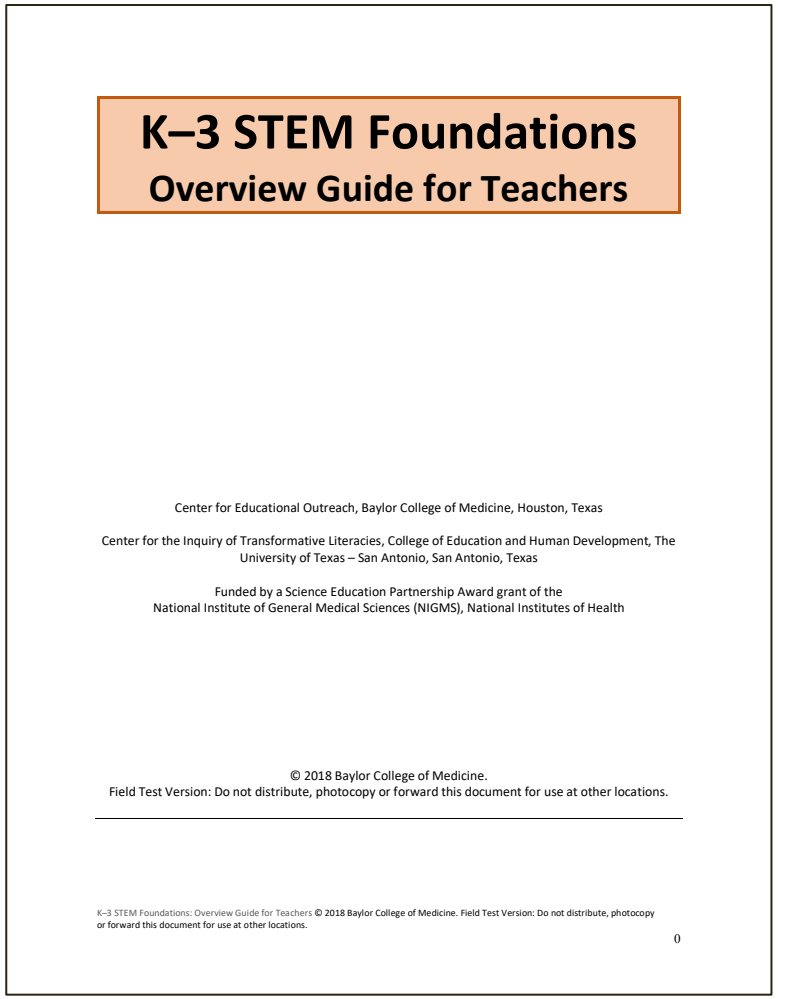
MM/DD/YYYY

- Please complete no later than 2nd day after teaching a lesson
- Make sure your ID number is correct!
- Provide information to the best of your ability
- Click “Done” on the final screen or it will not send!

OTHER INFORMATION YOU MAY NEED

- Overview Guide

- Project Participant Information Sheet



K–3 STEM Foundations
Overview Guide for Teachers

Center for Educational Outreach, Baylor College of Medicine, Houston, Texas

Center for the Inquiry of Transformative Literacies, College of Education and Human Development, The University of Texas – San Antonio, San Antonio, Texas

Funded by a Science Education Partnership Award grant of the
National Institute of General Medical Sciences (NIGMS), National Institutes of Health

Student ID Sheets

Assign each student an ID number

Keep attendance for each student on each lesson day.

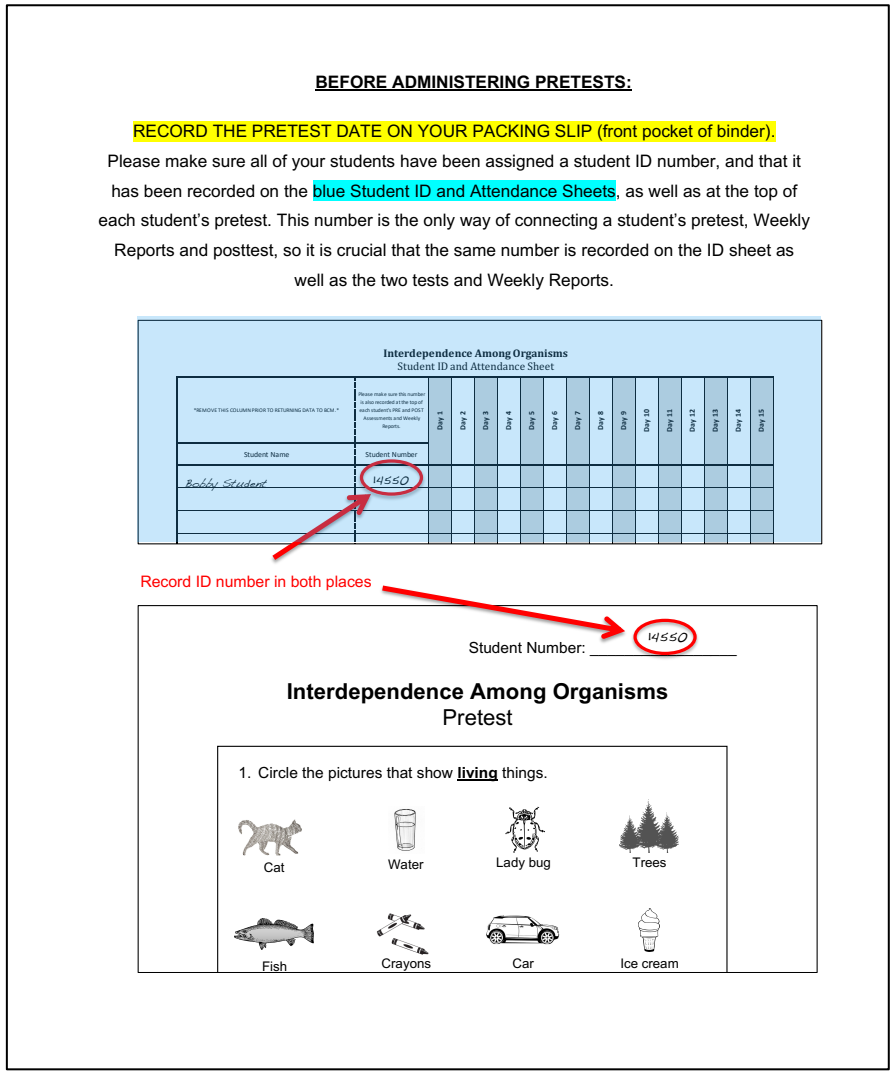
Interdependence Among Organisms
Student ID and Attendance Sheet

Please make sure this number is also recorded at the top of each student's PRE and POST Assessments and Weekly Reports.	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15
Student Number															
15	X		X												

Cut off name column before you send this sheet back to BCM.

These allow us to match student tests so it is VERY important to complete these correctly.

ID Sheet instructions are in your binder



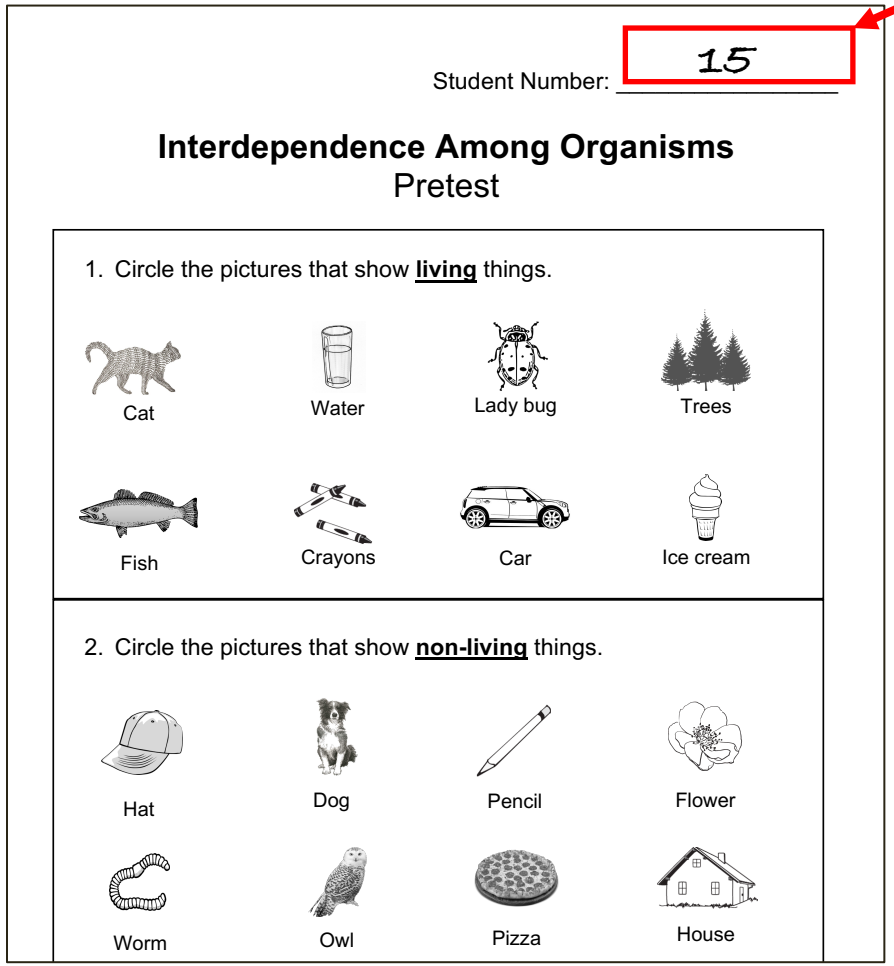
BEFORE ADMINISTERING PRETESTS:

RECORD THE PRETEST DATE ON YOUR PACKING SLIP (front pocket of binder).
Please make sure all of your students have been assigned a student ID number, and that it has been recorded on the blue Student ID and Attendance Sheets, as well as at the top of each student's pretest. This number is the only way of connecting a student's pretest, Weekly Reports and posttest, so it is crucial that the same number is recorded on the ID sheet as well as the two tests and Weekly Reports.

- Assign each student an ID number
- Record student numbers on ID and Attendance Sheet
- Make sure students record # on pretest, Weekly Reports and posttests
- Keep track of student attendance for each day

PRETESTS

Student number goes here



Student Number: 15

Interdependence Among Organisms
Pretest

1. Circle the pictures that show **living** things.

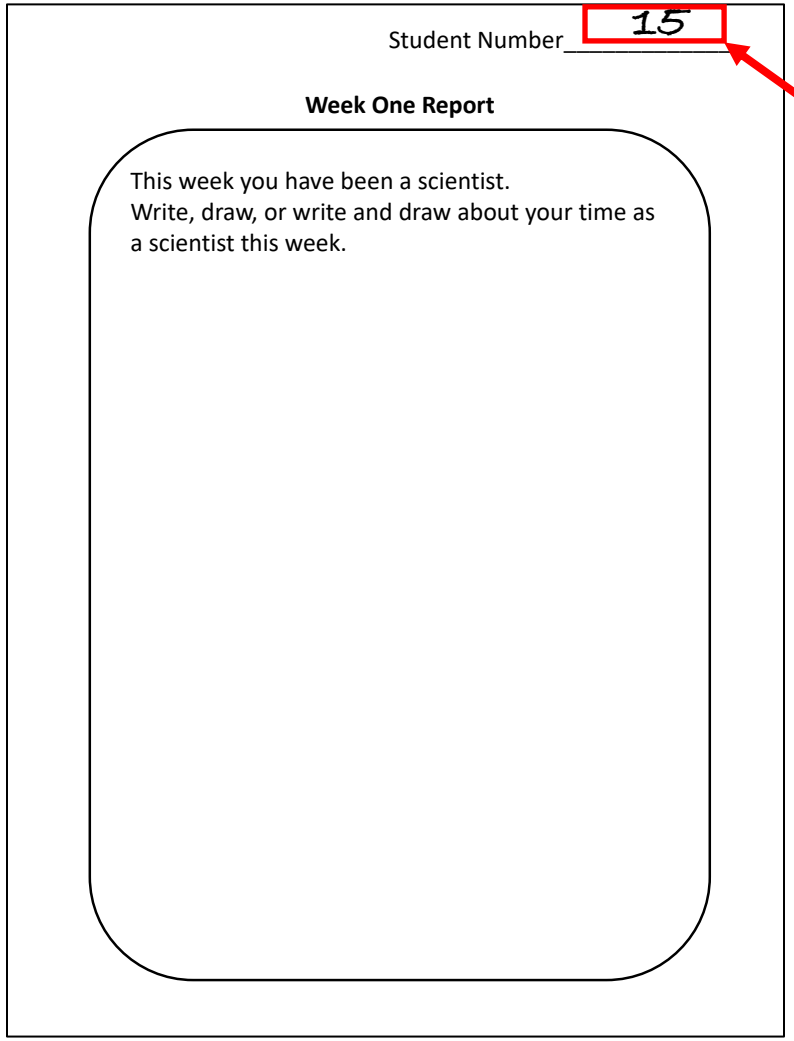
Cat, Water, Lady bug, Trees, Fish, Crayons, Car, Ice cream

2. Circle the pictures that show **non-living** things.

Hat, Dog, Pencil, Flower, Worm, Owl, Pizza, House

- Each student gets one packet
- Student Number is recorded at top
- Read items to students, but please don't discuss answers!
- Give on or prior to 1st day of lessons
- Record date on Return Packing Slip

Weekly Reports


Student Number 15

Week One Report

This week you have been a scientist.
Write, draw, or write and draw about your time as a scientist this week.

- Once each week. Please be sure to use the correct week!
- Make sure student numbers are the same as on their pretest.
- Record date of each report on Packing Return Slip.
- Please do NOT coach students or let them collaborate!

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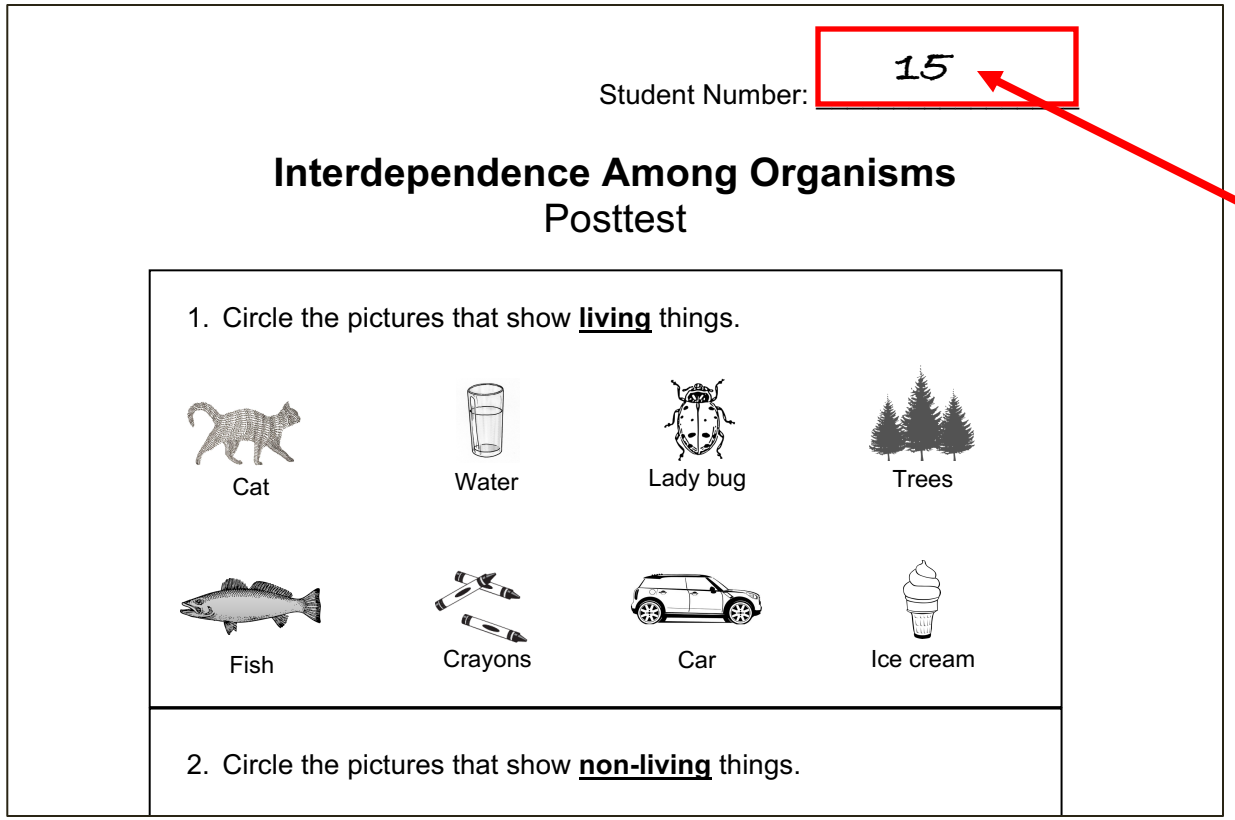
POSTTESTS



Student Number: 15

Interdependence Among Organisms
Posttest

1. Circle the pictures that show **living** things.

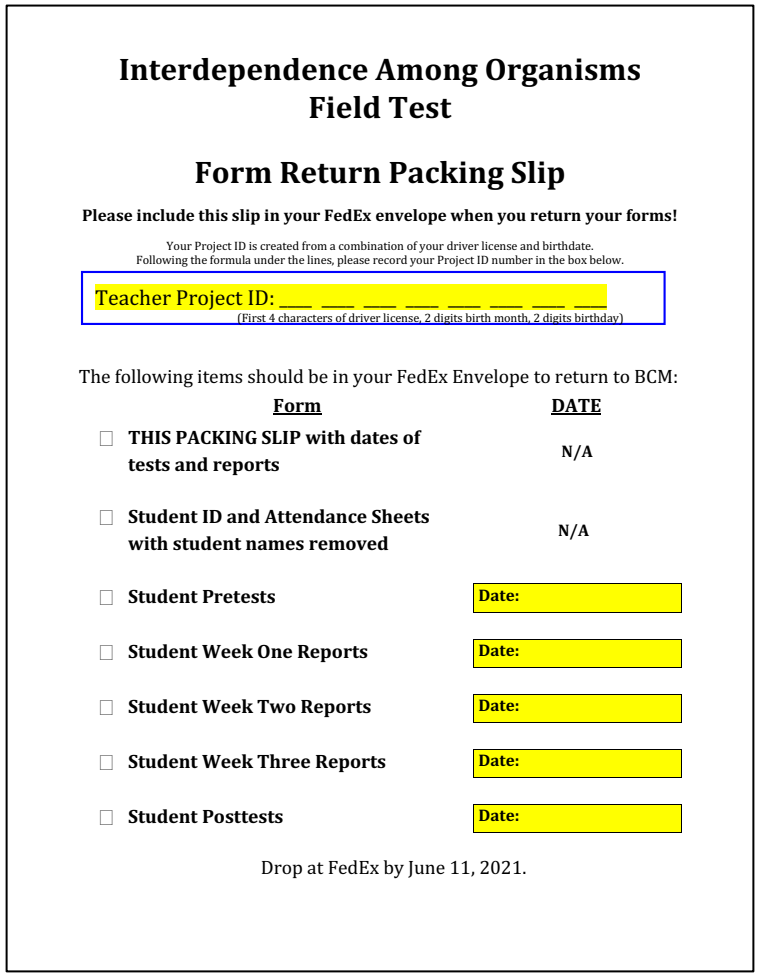
Cat | Water | Lady bug | Trees

Fish | Crayons | Car | Ice cream

2. Circle the pictures that show **non-living** things.

- The same as the pre-test – each student gets one packet
- Make sure the student numbers are the same!
- Even if a student did not take the pre-test, they should take the post-test.
- Record date on Packing Slip

RETURN TO BCM - FEDEX



Interdependence Among Organisms
Field Test

Form Return Packing Slip

Please include this slip in your FedEx envelope when you return your forms!

Your Project ID is created from a combination of your driver license and birthdate.
Following the formula under the lines, please record your Project ID number in the box below.

Teacher Project ID: ___ ___ ___ ___ ___ ___ ___ ___
(First 4 characters of driver license, 2 digits birth month, 2 digits birthday)

The following items should be in your FedEx Envelope to return to BCM:

	Form	DATE
☐	**THIS PACKING SLIP with dates of tests and reports**	**N/A**
☐	**Student ID and Attendance Sheets with student names removed**	**N/A**
☐	**Student Pretests**	**Date:**
☐	**Student Week One Reports**	**Date:**
☐	**Student Week Two Reports**	**Date:**
☐	**Student Week Three Reports**	**Date:**
☐	**Student Posttests**	**Date:**

Drop at FedEx by June 11, 2021.

- Prepaid envelop – just drop off at a FedEx box or location by June 11
- DON'T send whole binder! Just the forms listed on the Packing Slip.
- Include packing slip with ID number!

ONE LAST THING...

UNT Baylor College of Medicine

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You will receive a link to the field test post-evaluation by June 7th.

Please complete this link AFTER completing the field test!

Overview again

1. Select your 15-day period
2. Pretest
3. Daily - Teach the lessons AND complete online log
4. Once a week - student reports
5. Posttest
6. Complete the post-evaluation
7. Send forms back to BCM

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INTERDEPENDENCE AMONG ORGANISMS

QUESTIONS?