



Cockrell Butterfly Center & Brown Hall of Entomology

Knowledge Hunt

Dear Educator,

Thank you for downloading the free, online curriculum available at HMNS! We're thrilled to see that you are including the world-renowned Houston Museum of Natural Science in your educational toolkit.

Here at HMNS our mission has always been to provide exemplary educational opportunities for the community. Providing educators like you with free, fully editable curriculum is just one of many ways we are fulfilling that mission.

Thank you again, and we hope you enjoy your field trip to HMNS!

Best,
The HMNS Staff

How to use this guide:

1. Feel free to edit the questions as needed to suit your student group.
2. This Knowledge Hunt is structured by grade level, using appropriate TEKS from each level.
3. Visitor services and security staff are posted around the Museum and will be happy to assist you in finding any of the locations mentioned.
4. Please ensure that one chaperone is with every group of ten students at all times as they complete these activities.
5. Don't forget to download our extension activities for use in the classroom when you return from your trip!

Please direct any and all questions to curriculum@hmns.org



Kindergarten Extension Activities

Meet My Bug

Ask the students if they can remember some of the bugs they saw while visiting the Hall of Entomology. Talk about the three parts of an insect: the head, thorax, and abdomen.

Display pictures of insects. Point out the antennae, eyes, and mouthparts of the head, the legs and wings on the thorax, and the segments of the abdomen. Give each student three small Styrofoam balls, pipe cleaners, tissue paper, construction paper, toothpicks, etc.

Instruct them to create their own insect. Remind them to add all of the parts they saw in the pictures. Ask the students to name their insect and label them for display.

Cute as a Button

Give each student a button. If you have a large selection, allow the students to pick the color they prefer. Give each student a small square of paper and help them glue their button to the paper. Provide brightly colored permanent markers for students to add designs, wings, eyes, etc. When the students have finished the details on their bugs, they can add antennae and legs and name it. Display the button bugs.

Butterflies All In a Row

Give each student a colored craft stick and squares of construction paper. Tell the students to create their own butterfly by making colorful wings with designs and gluing them onto the craft stick. Encourage the students to make their butterfly as unique as possible. When the wings are dry, display the butterflies in a line on a long table that all students can gather around. Play “I Spy” with the students using their math words indicating position. For example: “I spy a butterfly before the purple one with round markings.” “I spy the third butterfly.” “I spy the fourth butterfly after the pink one.” Have the students point to the butterfly indicated.

The Bees and Me

Provide students with a variety of large colored pompoms, bow tie pasta, liquid school glue, and colored markers. Demonstrate how to glue the pompom in the center of the bow tie pasta. Use the markers to decorate the “wings” to make bees. Make two circles out of yarn on a long table that all the students can gather around. Ask students to put their bees one

at a time in alternating circles to show how the whole class “beehive” can be divided into two equal parts. Tell the students the number they started with, then count the number of bees in each circle. (The teacher might need to add her bee to make an even number.) Tell the students that each circle represents half of the whole.

What’s Bugging You?

Provide students with a variety of pasta shapes, pipe cleaners, Styrofoam balls, toothpicks, colored paper, beads, pompoms, craft sticks, and any craft materials available. Review with the parts of an insect students saw when they were visiting the Museum. Allow them to create their own insect or spider.

When every child has finished his/her creation, display them. Gather the students and ask them how their insect can be grouped by characteristics. They can look at the number of wings, number of legs, colors, size, etc. On a chart, write the criteria for grouping and record the number of creatures in each set. After the chart is complete, ask the students to look at the information and draw some conclusions using math terms such as more than, same as, and less than to compare two of the groups.

It’s a Bug’s World

Brainstorm the kinds of creatures the students saw while they were visiting the Butterfly Center at the Museum. Review the characteristics of each. Ask the students to choose one of the creatures to draw in a class mural to represent their day at the Museum. They should pay attention to the number of legs, the types of wings, mouthparts, and antennae. Display the mural for everyone to see.

Itsy Bitsy Spider

Teach students the song “Itsy Bitsy Spider”. Give the students half of a Styrofoam ball. Allow the students to paint them black. Provide wiggly eyes to be glued on the ball and black pipe cleaners cut into two inch sections to bend and stick into the ball for legs. Ask the students how many legs will be needed to make a spider. Attach a string to the top of the spider with a brad and wrap the other end around a plastic straw to wind the spider up and down.

Read “Little Miss Muffet” to the students and let them pretend to lower their spider and scare Miss Muffet away.

Egg Carton Critters

Cut Styrofoam egg cartons into single sections. Provide students with pipe cleaners cut into two inch segments, colored toothpicks, wiggly eyes, pompoms, colored construction paper, liquid glue, etc. Remind students that insects have three body sections, antennae, wings, and legs. Allow the students to make and name their critters, then display them in the classroom.

Numbers Gone Buggy

Provide a variety of insect images such as photocopies, stickers, or rubber stamps. Give students index cards with a number written in marker on it. Allow the students to decorate their number cards with the corresponding number of insects to match the number written on the card.

Beautiful Butterflies

Cover the students' tables or desks with newspaper. Give each student a white coffee basket filter (not a cone). Tell the students that they are going to create butterfly wings, so they will need to use many colors and create designs similar to the ones they saw on butterflies at the Museum. Allow them to use washable markers to completely cover the filters with color. With a spray bottle, lightly spray the filters so the color will bleed together slightly. When the filters have dried, show the students how to pinch the filter in the middle and wrap it with a pipe cleaner and extend the ends to make the antennae. Hang the butterflies from the classroom ceiling to create your own butterfly center.

See How They Change

Give each student a cheap paper plate. Show the students how to fold it into four equal parts. Review with the students the four stages of a butterfly's metamorphosis. Allow the students to pick one pompom and glue it in one section. Label it "Egg". Allow the students to pick four pompoms and glue them together in a line to form a caterpillar. Let them draw a leaf for the caterpillar to eat. Label it "Caterpillar". For the chrysalis give each student a lima bean and small square of plastic wrap. Demonstrate how to wrap the bean in the plastic wrap to form a "chrysalis". In the third space, have them draw a branch and glue their "chrysalis" hanging from it. Label this section "Chrysalis". In the last space, allow the students to create a butterfly using construction paper, glitter, sequins, pipe cleaners, and craft sticks. Label this space "Butterfly".



1st Grade Extension Activities

Hidden Animals

Read *How to Hide a Meadow Frog* by Ruth Heller. Allow the students to find the frogs hidden in each picture. Talk about how animals hide themselves using their shape, color, body markings, etc. Show pictures of other animals hidden in their environment, such as deer in leaves, butterflies on flowers, walking sticks on twigs, and moths with markings similar to their surroundings. Talk to the class about the characteristics that help animals hide. Give each student a frog die cut shape to color. They should add details and talk about how these details will help them hide. Have the students glue their frog on a sheet of paper and create an environment that will hide it.

This is Your Life

Read Eric Carle's *The Very Hungry Caterpillar* or *The Life Cycle of a Butterfly* by Lisa Trumbauer to introduce the life cycle of a caterpillar. Draw pictures of metamorphosis on the board and label them. Ask the students to use their bodies to show what the butterfly looks like as an egg. Have them show how the caterpillar stage looks. Next, have them stand and wrap their hands around their bodies to show how they are squeezed into the chrysalis. Finally, ask them to show what they would look like as butterflies flying freely around the room.

Ask students what they would look like now that they have emerged as butterflies. Give each student a craft stick and white construction paper. Allow them to use the stick to create their body and the white construction paper to draw and cut out their wings. Encourage the students to make their wings colorful and add details to give their butterfly personality. Display the butterflies with the student's names.

Beanie Buggies

Give each student a large white bean. Provide students with a selection of colorful permanent markers, glue, and an index card. Allow the students to create their own bugs by decorating the beans and adding details with the pens. Tell the students to glue their bean bug onto the index card. They may add antennae and legs. Tell the students to invent a name for their bug. Create a class display.

Can you find me?

Provide a variety of pictures of environments. Find a desert, forest, farm, swamp, etc. Try to find environments that are free of people and animals. Discuss with the students how all of the elements

of the environment are necessary for an animal to live and reproduce. Use one of the pictures to talk about the details of the environment and the kinds of animals that might live there and other animals that can not live in that environment. Let a small group of students pick one of the environments. On the back, they should list or draw all of the animals they can think of that would live there. Allow each group to present their environment and its animals to the class. The class can judge the animals as appropriately placed or not.

Classroom Rainforest

Mix a batch of claydough for the students using the recipe below. Allow the students to create their own animals and plants that can be found in the rainforest. Help the students with their decisions about what to create. After the students have made their pieces, assemble them in a large box (duplicating paper size). Colored paper objects may be used to fill in vegetation.

Claydough

Materials:

1 c. water

1 c. white flour

2 t. cream of tartar

1 c. salt

1 T. vegetable oil

food coloring

waxed paper

air tight containers

Directions:

Mix ingredients in a pot. Cook for 5 minutes over medium heat while stirring with a metal spoon. Dough will harden and gather on the spoon. Pour dough on waxed paper and cool. Store dough in airtight containers. It will last for about two weeks.



2nd Grade Extension Activities

Look up!

Remind students that when they entered the Butterfly Center, they looked up at a sculpture that showed the life cycle of a butterfly. Ask the students what four things they saw in the sculpture to show the metamorphosis of the butterfly. Ask the students to draw a garden picture that illustrates the metamorphosis of a butterfly.

Metamorphosis of Me

Tell students that metamorphosis means the changes of form an organism goes through in their life cycle. Ask students to bring three pictures from home. There should be a baby picture, one as a young child, and one as a second grader. Allow the students to create their own metamorphosis story by arranging the pictures in order. They may draw or find a magazine picture to show how they would like to look as an adult to complete the stages of their metamorphosis. Make connections with the students of how birth is the beginning of the life cycle and that the way they look changes with each stage of growth.

Let Me Out!

Remind the students that when they were looking at the poison dart frogs, they learned that the poison venom of these frogs comes from the things they eat in the rainforest. When they are removed from the rainforest and kept in captivity the frogs lose their toxins. Let the students imagine that they are visiting a rainforest and have an opportunity to safely capture a poison dart frog and bring it home. Tell the students to use the information about the changes that the frog would undergo to make a decision as to whether to keep a poison dart frog in captivity or allow it to remain wild in the rainforest. Allow the students to talk in small groups to discuss and justify the merits of their decision and present their conclusion to the class.

Super Bug

Show the students a picture of a bug, such as a grasshopper. Point out the head, thorax, and abdomen. Remind the students that the head is the part of the body most involved in the senses, the thorax contains the wings and legs, and the abdomen is the final 11 segments. The insect needs all three parts to survive. Talk to the students about the different kinds of mouths, eyes, and antennae bugs have. Allow the students to use all of the information they learned about insects to create their own Super Bug. Students should name it, tell where it can be found, and describe any details about it on an index card to be displayed with their bug.



3rd Grade Extension Activities

Is it a bird? Is it a plane?

Tell the students that they are to pretend that they are entomologists. Their job is to go to a tropical rainforest and capture exotic butterflies to bring back to the Museum. Remind the students about the dragonfly they saw in the Museum with the 30 inch wingspan. What if they saw that while looking for butterflies? The students are to write a story about their adventure and illustrate it. Tell them to include any information they learned about insects, camouflage, and the rainforest in their story.



Change is good!

Have students research the metamorphosis of an insect. They may pick a butterfly or any other insect that interests them. Ask the students to explain the process of metamorphosis using pictures and text boxes. Illustrations should be detailed and colored.

A Bright Spot

Tell the class that every living thing is found in a habitat or environment that allows it to survive and reproduce. Brainstorm with the class all the characteristics of the rainforest environment and talk about how they enable the poison dart frog to survive. Include a discussion about how its coloration aids in its survival. Create a T-chart on the board with all of the characteristics the students have suggested of a tropical rainforest. Allow students to research tropical rainforests to find other animals that live there. Let them create a class mural that shows the elements of a rainforest environment and the animals that live there. Students can create a text panel from an index card that explains why their animal is able to thrive in that environment.



Museum Break!

Read *Two Bad Ants* by Chris Van Allsburg. Talk about how the pictures are drawn from the ants' point of view to help the reader understand how the world looks from their perspective. Tell the

students to imagine that the poison dart frogs have escaped from their display case in the Museum. Ask them to write a story from the one of the poison dart frog's point of view. Describe where they go, what they see, and the details of their adventure. Have the students illustrate their story from the point of view of the frogs.

Look Harder!

Give each student a die cut shape of a butterfly or some other insect. Tell the students to create an environment and camouflage their insect so its coloration and/or design helps provide protection in its environment. Display the pictures and see if the class can find the camouflaged creatures.



Working Together

Remind the students that when they were in the Museum, they learned that plants and insects need each other and animals and humans need plants. Brainstorm some examples and write the suggestions on the board. Have the students create a drawing showing all the ways that plants, insects, animals, and humans work together to survive. Ask the students to write a short essay to accompany their drawing that explains the relationships they have illustrated.

Hidden in Plain Sight

Show students some examples of hidden picture activity pages. *Highlights® Magazine* has some excellent examples. Let the students see if they can find the items hidden in the pictures. Remind the students of all the insects, butterflies, beetles, and moths that they saw in the Museum that hid themselves in their environment. Let them draw their own hidden picture version of things they saw in the Brown Hall of Entomology. Ask the students to draw a key of hidden items. When all of the drawings are complete, allow the students to exchange their papers so their friends can search for the hidden insects.



Celebrate the Differences

Help students find resources to research butterflies and moths. Allow students to draw one butterfly and one moth that look similar. Then ask students to create a Venn diagram of the similarities and differences of a moth and butterfly. They will add their drawings to the Venn diagram for a display.

Computer Bugs!

Read Eric Carle's *A Very Hungry Caterpillar*. Be sure they understand the process of metamorphosis illustrated in the book. Review the steps of metamorphosis. Allow the students to pick an insect other than a butterfly. It can be a real insect that they research, or they may invent a "yet to be discovered" species. They will write a story of its metamorphosis. If the students know how to use Microsoft Paint, they can use technology to create their own "bugs". If they do not have computer access, they may use construction paper, glue, and markers. Students will create an easy book showing the metamorphosis of their insect and read it to a younger student.



Rainforest Relocation

Allow the students to brainstorm animals, birds, and insects that live in the rainforest. After the list is made, tell the students to think about adaptations that a creature would have to make to live in that environment. Write the names of some creatures that would not live in the rainforest on slips of paper. Have the students randomly pick one. They will draw their creature in a rainforest with adaptations it would have to undergo in order to live there. Ask them to include an explanation on the back of the picture.



4th Grade Extension Activities

Darting Away

Ask the students if they remember the poison dart frogs in the case at the entrance to the Brown Hall of Entomology. Tell them to suppose someone opened the case and they hopped away. The students are to write a story about their adventure. They need to try to write it from the frog's viewpoint, taking into consideration how the world looks from their position close to the ground.



Home Sweet Home

Every living thing is found in a habitat or environment that allows it to survive and reproduce. Instruct the students to choose one of the creatures they saw in the Brown Hall of Entomology and draw the environment it would live in. Look for examples of other environments. In small groups, ask students to discuss why their creature could or could not live in some of the other environments.

Hide Me!

Give students a die cut of a frog, butterfly, beetle, or other insect. Allow them to color and add designs to their insect. Then tell the students to create an environment in which their creature might live that would provide camouflage for its safety.



Flying Through

Many types of butterflies live in Texas or migrate through Texas on their way to other climates. Ask students to research some of the more common species of butterflies that might be seen in Texas. Using a die cut shape of a butterfly, create a chart of Texas butterflies. Students will color the shapes and add decorations to look like the actual butterflies. Display them with their names and note whether they are native to Texas or migratory.

Do You See What I See?

Ask the students to recall the exhibit in the Brown Hall of Entomology that showed how the world looks through an insect's eyes. Set up three learning stations with a kaleidoscope, binoculars, and a fish-eye mirror. Have a selection of pictures of birds, insects, and fish. Tell the students that the way that an animal sees is one form of adaptation. Let them look around the room through each object and try to determine which type of vision goes with each creature. Lead a class discussion in which students will learn that birds of prey need to see their prey from great distances, insects have compound eyes to detect predators from all sides, and fish have wide-angle vision to see food.



5th Grade Extension Activities

I Am an Arthropod!

Tell the students to imagine that they woke up one morning and discovered that they had become an arthropod. They should think about what they learned about the characteristics of an arthropod during their visit to the Museum. They will draw themselves looking like an arthropod and write a story about their day. They should think about how things would look through their insect eyes, how their antennae would be used, how they would camouflage themselves for safety, the number of legs they would have, how strong they would be, and anything else they learned about arthropods.



Winging It

Tell students to look at the chart they made in the Knowledge Hunt called “Winging It”. Using the descriptions, have them draw a picture of each insect.

Can You Find Me?

Have students create an insect camouflaged by shape, color, or design in its environment. They may show their pictures to a friend and see if their insect can be found.



Insect World Records

Make a class *Guinness Book of World Records* for insects using the information the class gathered during the Knowledge Hunt in the section entitled “Insect Achievements”.

Hollywood Attack

Have each student create a movie poster in which a giant insect, arachnid, beetle, or myriopod is attacking a city.



Now Serving

Ask students to use some of the information they read during the Knowledge Hunt in the “Finger Likin’ Good” section to design a menu for an insect café. They will create a sample insect meal to display with the menu. They should draw and color the insects, cut them out and glue them on a paper plate, and add details to show how they will be prepared and served.

Becoming a Butterfly

Ask the students to use a variety of sources to find pictures of five caterpillars. The students will use their colors and features to predict the kind of butterfly or moth they might turn into. Have them draw their predictions next to the caterpillar.



Survival Kit

Tell students that every living thing is found in a habitat or environment that allows it to survive and reproduce. Have them think about the poison dart frog that they saw when they first entered the Cockrell Butterfly Center. Have them draw a poison dart frog with a survival kit. Inside the kit, they will name and/or draw what it needs for survival.

Rain Sticks

Use a paper towel roll, uncooked rice, long pieces of crinkled tin foil, squares of waxed paper, rubber bands, colored and white paper, and markers to demonstrate how to create a rainforest rain stick. Cover one end of the paper towel roll with a square of waxed paper. Secure it with a rubber band. Crinkle the tin foil and put it inside the paper towel roll. Pour in $\frac{1}{4}$ cup of uncooked rice and cover the other end. Wrap the roll with construction paper and decorate it with a rainforest scene.

Provide the supplies for students to create their own rainforest sticks. Display them in the classroom.



6th Grade Extension Activities

Different but the Same

Draw and label the life cycle of a frog, and compare it to the life cycle of a butterfly. How are they different? How are they the same?



Home is Where You Lay Your Lily Pad

Every living thing is found in a habitat or environment that allows it to survive and reproduce. Talk about what a poison dart frog might need to survive and list all of the environments that it could NOT live in. Students can refer to their Knowledge Hunts to help them.

Ask the students to create a frog habitat in a classroom terrarium made out of an old fish tank. Assign the students jobs to maintain the environment. Alternatively, have each student create their own paper terrarium by cutting out/drawing pictures and pasting them together on one sheet of paper or in a shoebox. Place the terrariums around the room and ask the students to critique each ecosystem. Ask them if the frog has the appropriate items it needs to live.

To Have an Exoskeleton or To Not Have an Exoskeleton? That is the Question!

Divide the class into two groups. One group will argue that having an exoskeleton is good and the other group will argue that having an exoskeleton is bad. Using the information they wrote down in their Knowledge Hunt to help them, ask the students to conduct additional research to help form their arguments. Conduct a class debate on the exoskeleton topic and have the class decide which group is the winner.



Welcome to the Fabulous Rainforest!

Remind the students about the rainforest they visited at the Houston Museum of Natural Science. Ask the students to create a travel brochure to convince people to vacation in the rainforest.

Students may refer to the notes they took in their Knowledge Hunt about the components of the rainforest. Students should be sure to include pictures, descriptive words, and at least three persuasive statements in their brochure.

Unique is Key

Research the products and animals that are found exclusively in the Earth's rainforests, such as medicine, food, species, etc. Divide the class into small groups and assign each group a different resource to research. They should investigate how the loss of these resources could impact society. Groups should be prepared to present their findings to the class.



Where Would We Bee Without You?

When the students were visiting the Brown Hall of Entomology they took some notes and answered questions about bees. Ask the students to do additional research about honey bees. Students should find out more about why bees are so important to our way of life. Tell the students they will create an advertisement to convince humans that bees are our friends, not enemies.



7th Grade Extension Activities

The Ideal Environment!

Every living thing is found in a habitat or environment that allows it to survive and reproduce. Talk about what a poison dart frog might need to survive and list all of the environments that it could NOT live in.

Ask the students to list all the things a frog or toad needs to survive. Have each student create a frog/toad habitat in a terrarium made out of an old fish tank or shoebox. Students should create their own terrarium by cutting out or drawing pictures, or by finding different objects to place in their terrarium to reproduce the frog/toad's habitat. Ask each student to present their terrariums and explain the environment and why it is conducive to the life-style of their frog/toad. They should place a picture of their frog/toad on the outside of their terrarium.



A Day in the Life of a Frog

The frog in this picture looks like it is going somewhere. Create a story from the frog's point of view. Describe where it is going and what it is looking for. Explain what the frog might do during the day. Does he meet with friends? Does he explore? While writing the story, remember that frogs are closer to the ground and see things differently than you would.

Old Ecosystem, New Animals

Ask the students to choose an ecosystem (desert, rainforest, tundra, etc.). Keeping this specific ecosystem in mind, have the students create three animals to live in the surroundings: one decomposer, one consumer, and one producer. Students should draw their new animals as they would be found in their chosen environment, including at least two specific adaptations that help them survive. A paragraph describing in detail the environment and the role of each animal in the ecosystem should be included.



As Accomplished as an Insect

Tell the student to refer to their Knowledge Hunt where they recorded four insect achievements. Ask the students to share with the class the different accomplishments they recorded. Tell the students to think of something they have done that is similar to one of the insect achievements and create a class achievement book using all the students' data. The accomplishment can be in the same category as the insects they saw at the Museum or the students can create a new category.



8th Grade Extension Activities



Poison Dart Frog

Every living thing is found in a habitat or environment that allows it to survive and reproduce. Talk about what a poison dart frog might need to survive and list all of the environments that it could NOT live in.

Notice the vibrant coloration of the poison dart frogs. How does their coloration help them survive?

Inside the Rainforest

While visiting the rainforest, the students listed everything they saw in the environment that contributed to the survival of the plants and creatures there. Then students answered the question, "If you eliminated one of the elements listed, what do you think would happen?" Ask the students to explain in more detail why they think this would occur.

Tell the students to consider a desert-like environment and its inhabitants. Have them explain what would happen if the environment's temperature was drastically lowered, making the environment cold. How would the change affect the native fauna? How would it affect the ecosystem as a whole?

Inside the Entomology Hall



Insect Achievements

Tell students to refer to their chart and choose their favorite record holder. Tell them to find two more fun facts about it. Students should make a one page advertisement about how unique the insect is. Ask the students to promote their insect as the best by using the facts they have learned. Students should draw a picture and display the ads around the room. Have students take the time to walk around the room reading each advertisement. Afterwards, conduct a class vote for the best advertisement based on the most interesting facts given about an insect (they cannot vote for their own).