

Christian Kids Explore

Biology



Stephanie L. Redmond

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Library of Congress Catalog Card Number: 2003109967

ISBN: 1-892427-05-2

First Edition

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Printed in the United States of America

Bright Ideas Press
Dover, Delaware

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A NOTE FROM THE AUTHOR

I am like you. I am an average homeschool mom, working hard to ensure a sound education for my children and still maintain a respectable home. I have three precious children: Mike (16), Taylor (13), and Rachel (11). My husband, Andy, and I have been married for twenty wonderful years.

My main goal is to glorify God in all that I do. Part of fulfilling that goal is teaching my children to love the Lord their God with all their heart, soul, and might. If I am going to do that, I believe it is essential to teach them from a Christian worldview, using books that honor God.

In our years of homeschooling, I have used several types of study. Some I liked, others I didn't. However, a few years ago, I was introduced to classical education. Now, I'll admit we're not perfect examples of this, but I found it to be a wonderful way to set up our school. We follow the trivium, recognizing the grammar, logic, and rhetoric phases of our children's learning, and we teach history chronologically. We use Latin in our studies and read, read, read! However, for our elementary students, we've had a hard time finding just the right science book. I felt forced, at times, to use books that teach evolution as fact. While I was able to use this as an opportunity to teach my children God's truth, as presented in Scripture, I found that I longed for a *homeschool* book that would teach the same. From that, *Christian Kids Explore Biology* was born.

You must know that I am not a scientist. My credentials are that I homeschooled myself! Through much prayer and encouragement from friends, however, I found myself writing a homeschool science book. Therefore, I had this book reviewed and edited for science content by qualified people (see the Acknowledgments). During this process, I personally learned the joy of studying science and hope that I will be able to impart that excitement to you and your children. Most of all, I pray that your family is encouraged and God is glorified through the words of this text that seek to exalt God as Creator.

Because I am much like you, I understand the pressures that homeschooling mothers and fathers face. Time is critical and there is never enough of it. Therefore, this book has been designed taking that into consideration. First and foremost, *Christian Kids Explore Biology* is **written for multiple ages and grades**. While it is geared for 3rd to 6th graders, there are many ideas for younger ones, as well as for those who want to do more. The lessons are complete and concise, but there is room to bring in books from outside sources if you choose. Little advance preparation is needed. A list of the materials you will need is at the beginning of each unit so you can gather once per unit if you choose, instead of every week. Vocabulary lists are included, along with hands-on activities that reinforce learning. There is a gorgeous coloring page with each unit as well as a unit review. Also, there is an extensive book and resource list at the end of the book. This book seeks to offer you everything you need for a fruitful year of elementary biology, plus a little more.

Stephanie L. Redmond

*“Be exalted, O God, above the heavens;
Let Your glory be above all the earth.”*
(Psalm 57:11)

HOW TO USE THIS BOOK

This book contains 35 lessons. Each lesson is designed to be completed in one week. If you teach science twice weekly, you'll need to allow for about 60 to 90 minutes each day. Of course, this will depend on the student and the number of outside resources used.

Each lesson consists of a **Teaching Time** and a **Hands-On Time**. I recommend doing each on a separate day.

Teaching Time

- As each new lesson is begun, the text is read. You may read it to your students or they may read it to themselves. In the case of very young students, you might read it on your own and then discuss the information at their level. They may enjoy completing a Coloring Page while listening to you.
- After this lesson is read, the student should complete a "Daily Reading Sheet."

To make the study complete, you will need to do a little more:

- First, review recent lessons, particularly as they apply to your newest lesson.
- Second, if you make flashcards as you go (with vocabulary words, lesson facts, Scripture verses, etc.), you will want to review these.
- Third, have your student list the vocabulary words (any in bold lettering in the lesson, plus any they listed on their Daily Reading Sheet) and define them in their science notebook.
- Last, you'll want to allow time for outside reading and picture perusing and researching topics of interest. I recommend having your students complete additional Daily Reading Sheets for their supplemental reading, even if they use just a few pages from a particular book. (It's quite acceptable to pick and choose pages and chapters to read rather than an entire book!) All completed forms and written work should be kept in their science notebook.

Hands-On Time

Most children love hands-on learning, and it helps keep science exciting for your children (and you!). Although Hands-On Time can be time consuming, try to also make time for a little review as you are working. The "Checking It Out" science experiment form will often be utilized on these days and should be completed and filed in the student's science notebook.

It can be tempting to eliminate these activities to save time; however, I strongly advise otherwise. Science can be so exciting, but it can also be dull. It all depends on how it is taught. Elementary science is about discovery and taking joy in the journey. Have fun with it!

Coloring Pages

There is one Coloring Page per unit and all of these, plus a few extra, are in the Appendix. These may be photocopied. Children of all ages will enjoy these beautiful drawings. Some will even benefit from keeping their hands busy with markers or pencils while having lessons read aloud to them.

Show What You Know!

The last event for each unit is a “Show What You Know” review. These can be used as tests or merely as unit wrap-ups; it’s your choice. I’ve made the scoring fun, using thousands of points instead of one hundred. These, too, can be copied for each student and filed in his or her science notebook.

Reproducibles

There are several forms in the Appendix available for reproducing, according to your needs. The course is designed to be easily used with several children of differing ages, at the same time. If you do not have a home copier, make a trip to your favorite copy shop and reproduce several Daily Reading Sheets and Checking It Out forms (along with the Coloring Page and Show What You Know! page for each unit). The two forms are used frequently, so plan ahead. Is copying difficult for you? Make your own similar forms on the computer or simply use notebook paper. It’s the content—not the form—that counts!

What a Daily Lesson Could Look Like

TUESDAYS

- **Memory Work**—Review flashcards and vocabulary. *5 minutes*
- **Discuss** last lesson. *5 minutes*
- **Teaching Time**—Read or have student read new lesson; ask comprehension questions as you go. *10 minutes*
- **Discuss** new information. *2–3 minutes*
- **Daily Reading Sheet**—Have student complete a Daily Reading Sheet. *10 minutes*
- **Vocabulary**—Have student fill out (or assist your student in filling out) a vocabulary sheet or make flashcards, if you prefer, of the key words in their lessons. *10 minutes*
- **Books**—Outside reading time. This is where they have the time to peruse other sources, perhaps from the library. *30 minutes or more, as necessary*

THURSDAYS

- **Memory Work**
- **Hands-On Time**—Complete a relevant experiment or activity. Student can also use part of this time for ABC Book activities (see Appendix D) and discovery (research) activities.

Remember: Younger children do not need as much detail. Give them the facts and HAVE FUN! We are trying to include enough “work” for the older kids, but enough “fun” for the younger ones. If you have only young elementary (K–3) students, then even once a week is enough for science. If they are doing the memory work, though, bring out those flashcards two or three times per week. We like to go to the library and get lots of books on the subject at hand. (Not great for cells, but terrific for reptiles and nearly all else the course will go into.)

Instructions for Your Science Notebook

This section is addressed to your students; however, you may need to help them decide the best way to organize their science notebooks.

This year you will need to maintain a science notebook. The purpose of this notebook is to help you organize all your documents from your studies. An important part of good science is good record keeping. It is the only way to accurately track your findings.

I recommend a three-ring, loose-leaf notebook, about 1½ inches thick, with pockets on the inside of the covers. For tabs, I recommend tabs with labels. You have two options in this area:

- **Option 1—Unit by Unit:** For this method you will need eight tabs labeled “Unit 1”, “Unit 2”, and so on, through Unit 8. In each section you will file your Daily Reading Sheets, Checking It Out forms, and any other written work.
- **Option 2—Type of Work:** For this method you will need at least eight tabs, possibly more, and you will file your work chronologically, that is, in order by date. Your tabs should be labeled:

Daily Reading

Vocabulary

Diagrams (You might sketch some from your readings.)

Checking It Out

Reports

Coloring Pages

Field Trips

Photos (I highly recommend taking photos throughout the year of your Hands-On activities, field trips, and experiments.)

Your science notebook will provide an excellent record of your studies in biology!

UNIT THREE



BIRDS OF THE EARTH

UNIT THREE VOCABULARY

- ☞ aquatic birds
- ☞ birds of prey
- ☞ birds that don't fly
- ☞ cambered
- ☞ Class Aves
- ☞ diving birds
- ☞ game birds
- ☞ hummingbirds
- ☞ nocturnal
- ☞ pellet
- ☞ Phylum Chordata
- ☞ songbirds
- ☞ swimming birds
- ☞ wading birds
- ☞ warm-blooded

MATERIALS NEEDED FOR THIS UNIT

- ☞ Science notebook
- ☞ Sketchbook or notebook paper
- ☞ Pencil
- ☞ Colored pencils or crayons
- ☞ Gallon-size plastic milk carton
- ☞ Hay, straw, twigs, pine needles, or grass
- ☞ Twine
- ☞ Scissors
- ☞ Owl pellet (for purchase information, see Hands-On Time, Lesson 12)
- ☞ Old newspapers
- ☞ Small jar
- ☞ Dishwashing liquid (hand, not dishwasher)
- ☞ Strainer, coffee filter, or paper towels
- ☞ Dissection kit or tweezers and toothpicks
- ☞ Black paper, poster board (if desired)
- ☞ Camera
- ☞ Pinecones
- ☞ Peanut butter
- ☞ Birdseed
- ☞ String or yarn





LESSON 11

TAXONOMY

TEACHING TIME:
How Birds Are Classified

Have you ever heard of birds of prey? Birds of prey are the hunters. They are large birds. They have talons and hooked beaks to help them eat mice, snakes, and other small creatures. Birds of prey constitute just one type, or class, of bird. Today, you are going to discover other ways to group birds.

Since you have already studied the classification system, you know that all birds are in Kingdom Animalia. Now, if I tell you that birds have backbones, can you figure out which phylum they are in? You would be correct in putting them in **Phylum Chordata**. I have another question. Do you remember what comes after kingdom and phylum? If you do not, think of King Phillip. The next division in the classification system is *class*. All birds are in **Class Aves**. To belong in Class Aves, a creature must be warm-blooded (meaning its body maintains a constant temperature, relatively independent of its surroundings) with a four-chambered heart. It must have feathers, lightweight bones, and lay eggs. Does this sound like a bird? Of course it does.

There is more to classifying birds than this, though. Class Aves, like all classes, is then divided into orders. There are actually 27 orders of birds, and the order names are very difficult to spell and pronounce. Going through all of these would be quite a challenge. Instead we will learn about some other ways to group birds.

First of all, did you know that not all birds fly? These birds can be grouped together and include ostriches and penguins. Can you imagine what a penguin would look like flying? We'll call this group **birds that don't fly**.

Next there are the **birds of prey** that we mentioned before. They include eagles, hawks, and vultures. You can recognize birds of prey by their hooked beaks and long, sharp talons.

Next we have the **game birds**. These are the ones many people hunt. Quail, doves, and pheasants are in this group. Many people also like to eat these birds.

Swimming birds are another division. They have webbed feet and include ducks and geese. **Diving birds** are the ones that catch prey with their bills—unlike birds of prey, which

“So God created . . . every winged bird according to its kind. And God saw that it was good.”
(Genesis 1:21)





Discovery Zone

*What's the official bird of your state?
Check out www.50states.com/bird/
to find out.*

use their talons. Pelicans are an example of diving birds. There are also **wading birds**, such as herons and flamingos. Sometimes you will find swimming, diving, and wading birds all grouped together and called **aquatic birds**, or waterbirds.

Last, there are **songbirds** and **hummingbirds**. The songbirds are birds such as robins, nightingales, and mockingbirds. Hummingbirds belong in their own group because they are the only birds that can fly backward. They fly backward to get out of flowers.

This is definitely a simplified version of bird orders. As you read other books on birds, you may find other categories. You may hear of perching birds and running birds, for example. The orders can be grouped in a variety of ways since there are 27 of them. This is just a start.

Birds are wonderful fun to observe. The best way to observe them is to sit very still. Once they get used to your presence, they will go on about their routine. By being very still and quiet, you can watch them build their nests, gather food, and feed their young. You may also notice how they communicate with one another. Sitting quietly in my yard one night, I even had the joy of watching an owl silently, but very quickly, fly through on some great hunt.



Discovery Zone

An Amazing Story!

Read about God's remarkable design of the emperor penguin. The way these penguins lay eggs and tend their chicks will surprise you!



REVIEW IT!

List the key traits required for Class Aves.



HANDS-ON TIME: Bird Watch

Objective: To observe birds in their normal routine.

Materials

- Sketchbook or notebook paper
- Pencil
- Colored pencils, crayons

Instructions

1. Go on a bird watch. Be prepared to sit still and watch. Talking will discourage birds from behaving routinely. Morning and early evening seem to be good times to see birds in action.

2. Observe the bird activity around you. What are the birds doing? Are they making noises? Can you detect bird “families”?
3. In your sketchbook, make a page for each bird.
 - Sketch the bird, as best you can. You may even want to color it in. *Note:* Sketches are quickly made and are not intended to be perfect. Do not try to make your sketch perfect.
 - On the page, write the type of bird, if you know it.
 - On the same page, list the types of activities you notice the bird doing.
 - If you find the bird’s nest, you might want to write down facts you notice about the nest. Suggestions: Is it high or low? What is it made of? What kind of tree is it in?
4. You can continue this project, adding a little each day. You may discover a new hobby!

GRADES 1–3 OPTION: Make a Birdhouse

Materials

- Gallon-size plastic milk carton
- Hay, straw, pine needles, or grass
- Twine
- Scissors

Instructions

Adult supervision required.

1. Cut two large holes in the side of the milk jug.
2. Line the bottom of the jug with pine needles or other materials from the list.
3. Securely tie the twine onto the handle of the jug.
4. Hang the jug in a tree, high enough to be safe from dogs, cats, and kids! Make sure it is not in an area with too much activity.
5. Wait and see! Carefully check it out on a regular basis and see if a bird has adopted it as a home. Is a nest being built? You may want to keep a small pile of straw nearby, as well as twigs for the bird to use.
6. Complete a “Checking It Out” form (found in Appendix A).



Discovery Zone

What’s a scientist who studies birds called?

Answer

Ornithologist



Discovery Zone

Take part in the “Great Backyard Bird Count,” where your input matters. Go to www.birdsource.org for more information.

LESSON 12

Bird Diets

TEACHING TIME:
Eating Like a Bird

The Bible uses many kinds of birds to teach us things about ourselves.

*“But those who wait on the Lord
Shall renew their strength;
They shall mount up with
wings like eagles,
They shall run and not be weary,
They shall walk and not faint.”
(Isaiah 40:31)*



Has anyone ever said that you eat like a bird? Did you wonder what they really meant? When people use that phrase, they usually mean that someone does not eat very much. In truth, eating like a bird would depend on the type of bird. Just as bird feathers, wing design, and size vary from bird to bird, so does diet.

Birdseed and a Lot More!

Have you ever fed birds from your yard? Did you put out birdseed? If you did, you may have noticed that birds such as robins, blue jays, and mockingbirds turned up. They are songbirds or perching birds, and they eat seeds. These are not the only seed lovers. Certainly, these are some of them, though. (Squirrels are seed lovers, too!) These birds do not eat only seeds, however—insects are also a favorite part of their diet. I’m sure you’ve also noticed that many of these birds feed worms to their babies. With a diet of seeds, worms, and insects, would you classify them as herbivores, carnivores, or omnivores?

There are many birds that feed primarily on fish. Eagles are one of them. Wading birds, also, are often fish eaters, and it should not surprise you that diving birds, such as pelicans, are, too. Some wading birds also eat frogs and shrimp.

Other Diet Favorites

Birds of prey often eat mice and other rodents. They also eat fish and insects. You can see they are basically carnivores. Most birds of prey hunt during the daylight hours.

Owls differ from other birds of prey in that they are primarily active at night. This is called **nocturnal**. Owls feed on living animals, from insects to rodents. The size of the owl determines the size of prey that can be handled. Bigger owls eat bigger prey. Owls usually eat their food whole. The parts that cannot be digested, like bones and feathers, are formed into a ball called a **pellet**. These pellets are then coughed up, basically. By dissecting a pellet, you can see exactly what the bird ate.

Plants are a favorite of some of the birds that don’t fly, such as ostriches and emus. Birds such as pigeons and doves enjoy fruits and seeds. Hummingbirds feed on nectar and insects.

As you can see, eating like a bird can mean many things. Fortunately for the birds, God designed each of them with the bills and claws that they need for finding, catching, and eating food. Birds of prey have their hooked beaks, specially made for tearing meat from bones, while flamingos have a strainer of sorts in their mouths that lets the water out and leaves the food in. Hummingbirds were created with long, narrow bills that can reach deep into flowers for nectar. Flying backward helps them get out again. Having read all of this, I'm sure you'll think twice when someone says that you eat like a bird!



HANDS-ON TIME: Dissect an Owl Pellet

Objective: To learn more about owl diets and digestion.

(First to third graders may have difficulty with this experiment, therefore an alternate activity is provided for them below.)

Note: Owl pellets can be ordered from many different companies. I ordered mine from www.sciencestuff.com.

Materials

- Owl pellet
- Old newspapers
- Small jar
- Dishwashing liquid (hand, not dishwasher)
- Strainer, coffee filter, or paper towels
- Dissection kit or tweezers and toothpicks
- Black paper, poster board (if desired)
- Camera!

Method

1. Read the booklet that accompanies your owl pellet.
2. Gather all necessary materials and prepare your work area. Cover your work surface with newspapers before beginning.
3. Fill a small jar with water and add a few drops of hand dishwashing liquid. Soaking your pellet is not necessary, but it does make the dissection easier.
4. Add your pellet to the jar, gently shaking it. This will help break your pellet apart.
5. Using a strainer lined with a coffee filter or a couple of paper towels, carefully pour the contents of your jar into the sink or yard. BEWARE: You will basically have a lot of wet animal fur or bird feathers. Be prepared!
6. Use tools found in a dissection kit or a tweezers and toothpicks to carefully sort out the contents of the pellet.



Discovery Zone

There are 17 species of barn owls worldwide, but only 1 species lives in North America. See if you can learn more about our native barn owl.



Discovery Zone

The study done of one barn owl revealed over the course of a year the following diet:

- 1,407 mice*
- 143 rats*
- 7 bats*
- 5 young rabbits*
- 375 house sparrows*
- 23 starlings*
- 54 other birds*
- 4 lizards*
- 174 frogs*
- 25 moths*
- 52 crickets*

7. Sort all the bones onto a piece of black paper and discard the fur.
8. According to your booklet, try to determine what your animal remains are. You can then glue your bones down on paper or poster board.
9. Don't forget to take pictures!

Evaluation

1. What is the purpose of this experiment?

2. What size owl pellet did you receive?
 Small Medium Large
3. Explain below what you knew about owl pellets before the dissection, especially about what they are and how they are formed.

4. What do these pellets contain? _____

5. When removed from its packaging, the pellet looked:
 (*Circle your answers.*)

Color	Red	Brown	Black
Shape	Flat	Round	Oval
Texture	Smooth	Rough	
6. Did you soak the pellet?
 YES NO
7. If so, describe your reaction when you strained it.

8. What did your pellet contain?

(Check all that apply.)

- Grass
- Straw
- Bones
- Animal Skull
- Fur
- Feathers
- Animal Tail
- Claws
- Nails
- Dirt
- Other

9. How many bones did your pellet contain?

- Zero
- 1–10
- 11–20
- 21–50
- More than 50

10. What type of animal did your pellet appear to contain?

- Vole/mouse
- Bird
- Shrew

11. I enjoyed/did not enjoy this experiment. In my opinion, this experiment was successful/unsuccessful because





Discovery Zone

Bird Bath

Birds love baths! Place a shallow pan (an old pie plate or garbage can lid) under a low tree branch. Hang a garden hose over the branch and turn it on so that a trickle of water makes a little splash in the pan. You'll have lots of visitors for a bath!

GRADES 1–3 OPTION: Feed-the-Birds Activity

Materials

- Pinecone (or several, if you wish)
- Peanut butter
- Birdseed
- String or yarn

Instructions

1. Tie a piece of yarn around the pinecone. Leave a long tail extending.
2. Spread peanut butter all over the pinecone, heavily.
3. Roll the pinecone in birdseed, getting as much birdseed as you can on it.
4. Hang the pinecone from a bush or tree. Try to hang it where it will be somewhat protected from the rain (or snow).
5. Observe what happens over the next few days. Do birds begin to come to it? Do they eat from it? How long does it take for the birdseed and peanut butter to disappear? How much food is still on the pinecone each day?

Evaluation

1. In your science notebook, write “Day 1,” “Day 2,” and so on. Record what you see each day, especially if you actually see birds eating from your pinecone.
2. Fill out a “Checking It Out” form. Put the form in your science notebook.

LESSON 13

Bird Structure

TEACHING TIME: Bird Bones and More

Birds are fascinating creatures. They range in size from 7/100 of an ounce, as in the case of certain hummingbirds, up to 275 pounds for the larger ostriches. Most birds can fly and, as you have already learned, some can dive into water. Some can even glide in the air for hours at a time. There are more than 8,500 species of birds.

Specialized Equipment

God made sure when he created birds that they had all the equipment they would need. One special piece of equipment He gave birds is hollow bones. All their bones are not hollow, but many are. Can you think of a reason birds would need hollow bones? Well, the biggest reason is that these hollow bones help them stay light enough to fly. Even though hollow bones are beneficial, they could make the skeleton weak and too easily broken. For added strength, God designed birds with tiny, crisscrossing, tube-like structures throughout their skeleton. These “tubes” add great support to the skeletal system. As a result, a bird’s frame is both lightweight and very sturdy.

Also in the area of flight, God designed birds with a variety of feather types. The differing shapes of the feathers, as well as of the wings, are very important for flight. Some birds even have silent wings. By that, I mean that when these birds flap their wings, virtually no sound is heard. What kinds of birds would need silent wings? Predatory birds, of course, would need this feature because it allows them to swoop in on their prey and catch it unaware. Noisy wings would not help an owl catch a mouse, would they?

Different types of birds have different numbers of toes. Did you know that? Some birds have two toes, some have three, and some even have four. Before we end our study of birds, we should discuss the primary features of birds. Birds have:

1. Beaks instead of teeth
2. Hooked beaks, in the case of birds of prey
3. Keen eyesight (which means very good eyesight)
4. Slender, light legs and feet
5. **Cambered**, or curved, wings for lift



*Have you ever dreamed of flying?
The psalmist wished he could at a
time when many were against him.*

*“So I said, ‘Oh, that I had wings like
a dove! I would fly away and be at
rest.’ ” (Psalm 55:6)*





Discovery Zone

1. *What's the largest flightless bird?*
2. *What's the fastest flying bird?*

Answers

- 1. Ostrich, 2. Spine-tailed swift*

Birds and Airplanes

Do you know that birds and airplanes can be similar in design? The largest airplane in America's fleet is the C-5. It weighs 769,000 pounds when it is full of cargo and fuel. Do you remember the little crisscrossing bones we discussed? Well, the C-5 has a similar feature. Like birds, the C-5 uses smaller pieces inside the wing to strengthen it. Airplanes also have cambered, or curved, wings like birds. The camber causes the air to move across the wing in such a way that there is a pressure change. This change in air pressure creates lift. While modern science has enhanced flight in unbelievable ways, the basics are still very similar to God's original designs.

Birds and the Bible

The Bible refers to birds many times. God even uses birds to encourage us about His love for us. Jesus tells us that we don't have to worry about what we will eat, drink, or wear. He then gives an example saying, "Look at the birds of the air, for they neither sow nor reap nor gather into barns; yet your heavenly Father feeds them. Are you not of more value than they?" (Matthew 6:26) This reminds us that God takes care of the birds and He will also take care of us.

ONE STEP FURTHER

There is much more to learn about all that airplanes and birds have in common. If you are interested in knowing more about this, you should find books on airplanes and books on birds and compare their features.





HANDS-ON TIME: UNIT THREE WRAP-UP

Show What You Know!

Answer as many questions as you can without using your book or notes. You get **10,000** points for each correct response. After going through the review once with your book closed, open your book and try again. You get **5,000** points for each additional correct answer. So, **show what you know!**

1. How many different species of birds are there? Circle the correct group.

- 1–100
- 100–1,000
- 5,000–10,000

2. Unscramble this word to name the curve of a bird's wing: R M C A E B

3. Are birds warm-blooded or cold-blooded? (Circle the correct answer.)

4. List as many categories of birds as you can.

5. What is the only type of bird that can fly backward? _____

6. Please describe what a bird pellet is.

7. What special features do birds of prey have that help them catch and eat their prey?

LESSON 13/BIRD STRUCTURE

8. Birds are classified in:

- Kingdom _____
- Phylum _____
- Class _____

9. Name at least three traits required for Class Aves.

FIRST ATTEMPT

_____ *(number of correct responses x 10,000)*

SECOND ATTEMPT +

_____ *(number of correct responses x 5,000)*

TOTAL NUMBER OF POINTS _____

WRITING ASSIGNMENT

In your science notebook, complete the creative writing assignment below. Have fun with it!

Happy birthday to you! You just successfully pecked and poked your way out of that pesky egg. Creatively describe one year of your life as a migratory bird. Include details about the terrain you fly over, the food you eat, the predators you escape from, and so forth.

APPENDIX A



REPRODUCIBLE FORMS AND MAPS

Checking It Out Experiment Form

Name _____

Unit # _____

Date _____

Name of Experiment _____

Book(s) used _____

Objective

Today I am trying to find out _____

Hypothesis

Based on what I have read and studied, I believe _____

The Experiment

To test out this theory, I plan to _____

Desired Result

Actual Result

- I am pleased with the result I received
- I am not pleased with the result I received

I believe this experiment would have gone better if _____

I learned _____

Daily Reading Sheet

Name _____

Unit # _____

Date _____

Title, Author, Page #'s

Main Topic

I learned

I enjoyed learning about

I never knew that

Facts

I would like to know more about

Vocabulary

Field Trip Journal

Name _____

Unit # _____

Date _____

Destination _____

Purpose _____

I saw _____

I also saw _____

I learned _____

The **most interesting** thing I saw (or learned) was _____

The **most unusual** thing I saw (or learned) was _____

I would like to have **learned more** about _____

I think I could learn more about this by _____

Plant Observation Form

Name _____

Unit # _____

Date _____

Type of Seed(s) Planted _____

Plant Container(s) _____

Type of Soil _____

Location of Plant _____

Record observations on chart below, for two weeks.

Here's an example:

Day	Sunny?	Clouds?	Soil?	Growth?	Observations
1	All day	No	Moist	None seen	Soil seems too wet
Day	Sunny?	Clouds?	Soil?	Growth?	Observations
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

APPENDIX E



ADDITIONAL COLORING PAGES

ARTWORK BY DAVID W. TAYLOR







Aquatic Birds Coloring Page

APPENDIX G



ANSWER KEY

APPENDIX G/ANSWER KEY

Conifers

3. pine scent, needle-like leaves, produce cones, *evergreen*
4. spruce, junipers (Note: Student may list others. These are the ones in the lesson.)

Broad-leaved Trees

5. broad, thin leaves; sometimes produce flowers at certain times of the year; often deciduous, meaning they lose their leaves in autumn

Unit Two Wrap-Up

1. Plantae
2. roots, stems, leaves, flowers
3. the flower
4. the leaves
5. photosynthesis
6. green, catalyst
7. glucose, oxygen
8. light or sunlight, H₂O, CO₂, chlorophyll
9. ovule
10. anthers
11. Bees carry pollen from one flower to another. Answers might also include insects, birds, wind, mammals, and water.
12. the ovaries
13. female
14. dry fruits, juicy fruits, pomes, drupes
15. coniferous
16. deciduous
17. Answers will vary but should contain following basic information: Trees are designed to stop feeding their leaves and sending water to them in order for the tree to have enough nutrition to live through the winter. This lack of water and nutrients causes the leaves to stop producing chlorophyll, so the leaves are no longer green.

UNIT THREE

LESSON 11

Review It!

Student may list any of these: four-chambered heart, feathers, lightweight bones, lays eggs, warm-blooded

LESSON 13

Unit Three Wrap-Up

1. 5,000–10,000
2. camber
3. warm-blooded
4. songbirds, hummingbirds, wading birds, birds of prey, birds that don't fly, game birds, diving birds, swimming birds

5. hummingbird
6. The indigestible parts of prey formed into a ball and coughed up by the bird.
7. hooked beaks, long talons, silent wings
8. Kingdom Animalia, Phylum Chordata, Class Aves
9. four-chambered heart, feathers, lightweight bones, lays eggs, warm-blooded

UNIT FOUR

LESSON 14

Review It!

1. have hair somewhere on body, feed milk to their young, are warm-blooded
2. monotremes, marsupials
3. to nourish the growing baby until it is time to be born

LESSON 16

Review It!

1. Order Carnivora
2. jackals, foxes, coyotes, dogs, wolves
3. lions, tigers, housecats, cheetahs, jaguars, ocelots, and more
4. They can retract, or pull in, their claws.
5. warm-blooded. They are mammals, and all mammals are warm-blooded.

LESSON 17

Hands-On Time

- Kingdom Animalia
- Phylum Chordata
- Class Mammalia
- Order Primates

LESSON 18

Unit Four Wrap-Up

1. have hair on their bodies, produce milk for their young, are warm-blooded
2. monotremes, marsupials
3. in a part of the mother's body called the uterus
4. to nourish the baby before it is born
5. duck-billed platypus
6. marsupial
7. in the mother's pouch
8. Order Carnivora
9. meat eaters
10. cats, lions, tigers
11. claws

APPENDIX H



SUGGESTED FURTHER READING

BY REBECCA DELVAUX

RELATED LITERATURE

- The Potato: How the Humble Spud Rescued the Western World, Larry Zuckerman. Want to interject some fascinating history into your study of plants? This book will do it. Although written for adults, many children will find parts of it fascinating as a read aloud.
- Tree in the Trail, Holling C. Holling. (Houghton Mifflin Co; ISBN: 039554534X; Reprint 1990). UG The cottonwood tree's tale along the Sante Fe Trail for over 200 years. Indian medicine integrated into story. (Plant/tree unit)
- Apple Picking Time, Michelle Benoit Slawson. (Dragonfly; ISBN: 0517885751; 1998). 32pp. LG Story about a young girl's experience during apple picking season in her small town where everyone is involved in picking them. Nostalgic, community- and family-focused.
- The Secret Garden, Frances Hodgson Burnett. (Penguin; ISBN: 0141182180; 1999). 304pp. (also in audio format) UG/LG
- Berenstain Bears' Big Book of Science and Nature, Stan and Jan Berenstain. (Random House Trade; ISBN: 0679886524; 1997). 64pp. LG (animals, insects, plants, weather, and some experiments)

MISCELLANEOUS CORRELATED RESOURCES

- Scholastic Root-View Farm kit by Toys R Us, Dr. Toy Winner 100 Best Children's Products, Amazon.com SKN:361154, \$20.
- Botany Adventures Kit, Scientific Explorer. \$15 www.HomeTrainingTools.com If you have some budding botanists and wish to delve further into the study of plants, you might enjoy this kit which offers the opportunity to replicate some of Mendel's plant experiments - cross-pollination, the effects of light, dark, sound, differing environments on the growth of plants, and germination among other activities. LG/UG

NOTE: Look for other items related to various topics in this unit in the video, field trip, and magazine section at the end of this list.

UNIT 3—BIRDS

- † Special Wonders of Our Feathered Friends, Buddy and Kay Davis. (Master Books, 2001). 80pp. \$13 AIG LG/UG/Adult
Written by staff members of Answers in Genesis. 30 beautiful photographs of animals from around the world supplement the educational text.
- † 95 Animals of the Bible, Nancy Pelander Johnson. 104pp. \$13 AIG LG/UG
- How Do Birds Find Their Way? Roma Gans. (HarperTrophy; ISBN: 006445150X; 1996) 32pp. LG
- A Nest Full of Eggs (Let's-Read-And-Find-Out Science), Priscilla Belz Jenkins. (HarperTrophy; ISBN: 0064451275; 1995). LG
- Watching Water Birds, Jim Arnosky. (National Geographic Society; ISBN: 0792270738; 1997). 32pp. LG CM
- All About Owls, Jim Arnosky. (Scholastic Trade; ISBN: 043905852X; 1999). 32pp. LG CM
- Fine Feathered Friends (Cat in the Hat's Learning Library), Tish Rabe. (Random House (Merchandising); ISBN: 0679883622; 1998) 48pp. LG One book of a series mentioned in this list for beginning readers or as read alouds for unit introduction.
- Eyewitness: Bird (Eyewitness Books), David Burnie. (DK Publishing; ISBN: 0789465507; 2000). 64pp. UG
- Birds (Our Living World series), Edward R. Ricciuti. (Blackbirch Marketing; ASIN: 1567110533; 1993). 64pp. UG Award-winning series.
- Check for other titles in the Animals in Order series listed under Classification in the first chapter.

ABC BOOKS

- The Bird Alphabet Book, Jerry Pallotta. (Charlesbridge Publishing; ISBN: 0881064513; 1990) 31pp.

RELATED LITERATURE

- Seabird, Holling C. Holling. (Houghton Mifflin Co; ISBN: 0395266815; 1978) UG (Salt water life or bird unit)
- Owl Moon, Jane Yolen. (Philomel Books; ISBN: 0399214577; 1987). 32pp. LG
Owling in the moonlight on a cold winter eve – a girl and Pa listen, watch, and find delight. Caldecott Medal winner. (also in audio format)
- On the Wing: Bird Poems and Paintings, Douglas Florian. (Harcourt; ISBN: 0152004971; (March 1, 1996) 48pp. LG/UG This funny, prolific poet and artist created this truly unique collection of bird poetry and paintings. Sensational!

MISCELLANEOUS RESOURCES

- David Sibley's web site and on-line bird art collection. David Sibley began drawing birds at age 7 years and is still doing it. You may send questions to him @ david@sibleyart.com. Check-out his artwork @ www.sibleyart.com.
- Sibley on Birds weekly newspaper column – check your newspaper to see if they carry this new syndicated column distributed nationally by the New York Times Syndicate. Short, highly informative articles with full-color bird illustrations.
- The Sibley Calendar 2003, David Allen Sibley. (Workman Pub Co.; ISBN: 0761126260; Wall edition 2002) 28pp. David Sibley is ranked in high regard by fellow birders for his written work and artwork on birds. This calendar contains a vast array of his paintings and a much information about birds. This might be appreciated by a bird-loving child especially of UG age.

NOTE: Look for other items related to various topics in this unit in the video, field trip, and magazine section at the end of this list. Check the list in Unit 1 under Classification System.

UNIT 4 –MAMMALS

- † Special Wonders of the Wild World, Buddy and Kay Davis. (Master Books, 1999). 80pp. AIG LG/UG/Adult
Written by staff members of Answers in Genesis. 30 beautiful photographs of animals from around the world supplement the educational text.
- † 95 Animals of the Bible, Nancy Pelander Johnson. 104pp. \$13 AIG LG/UG
- Eyewitness: Mammal (Eyewitness Books), Steve Parker. (DK Publishing; ISBN: 0789465604; 2000). 64pp. UG
- The Magic School Bus Explores the World of Animals, (Magic School Bus), Joanna Cole and Nancy White. (Scholastic Trade; ISBN: 0439226783; 2001). 32pp. LG
- Polar Mammals (True Book), Larry Dane Brimmer. (Children's Press; ISBN: 0516261126; 1997). 48 pp. UG
- Is a Camel a Mammal? (Cat in the Hat's Learning Library), Tish Rabe. (Random House (Merchandising); ISBN: 0679873023; 1998) 48pp. LG
Fun content-containing beginning reader or read aloud introduction to unit about mammals.
- The Biggest Animal on Land (Rookie Read-About Science), Allan Fowler. (Children's Press; ISBN: 0516200712; 1996). 32pp. LG
- Sorting Out Mammals -Everything You Want to Know about Marsupials, Carnivores, Herbivores, and More! Samuel G. Woods. (Blackbirch Press; ISBN: 1567113729; 1999). 32pp. UG
- Check for other titles in the Animals in Order series listed under Classification in the first chapter.