

Biology for the Grammar Stage

Susan Wise Bauer says in her book *The Well Trained Mind* that the goal of grammar stage science instructions is to “foster enthusiasm for science and to expose the child to basic facts about each field”¹. My goal in writing this curriculum was to provide a hands-on science curriculum that would challenge your child and instill a love of science at an early age. I also wanted to provide you with the tools to give your grammar stage child exposure to animals, the human body and plants so that they will have a knowledge base for future use. For this reason, I have included ongoing projects, experiments every week and narration pages.

I wrote this curriculum to be used in the grammar stage (1st-4th grade). It is designed to be done in 10-15 minute session 5 times a week. Usually you will spend 3 days reading and narrating, one day on an experiment and one day on an activity or project. You can adjust the plans to two 30 min days a week by doing all the readings and narrations on one day, followed by the experiments and activities on the second day. Finally, if you desire, you could set aside an hour a week to be your science day in which you do all the readings, narrations, and activities planned for the week. Please feel free to act as your child’s scribe as you complete the narrations and experiments.

Ongoing projects:

Ongoing projects are designed to be done over several weeks. One of these projects is the bird feeder project, which is designed to be completed over 4 weeks. First, your student will build a bird feeder and hang it where it can be seen. Then they record their observations of visiting birds and other interesting happenings in a journal. Other ongoing projects are the food chart, the animal study, the body project and the plant growth project. All the pages and pictures needed for these projects are included in the student workbook or at the end of this guide.

Experiments:

Experiments are easy to do and whenever possible they tie into what is being studied. With the exception of a few fun experiments, each one is written up. This gives your child a beginning look at what the scientific method is and how a scientific test works. Any time you see a box for a picture of your experiment you can have your child draw what is there or you can take a picture and glue it in the box. All the pages you need are included in the student workbook.

Experiment Page

Name: _____

Date: _____

Reflectors Experiment
Does A Cat's eye glow in the dark?

What we did: _____

What I think is going to happen: _____

Results: _____

What I saw at the end of the car in a dark room... _____

What I saw at the end of the car with a flashlight... _____

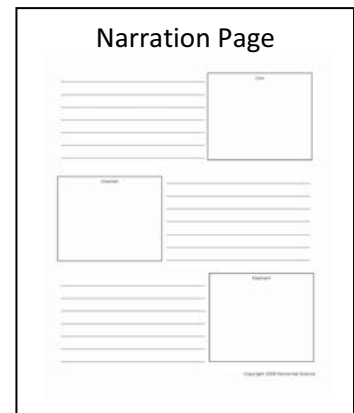
What I learned: _____

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¹ Susan Wise Bauer, *The Well Trained Mind: A Guide to Classical Education at Home*, (W.W. Norton & Company, 1999) 375

Narration Pages:

Narration pages are designed to be used after a section is read in the encyclopedia. Your child will tell you (or write for themselves) what they found most interesting. You could ask, What was one thing you learned about ___? What do you like the best about ___? Only expect one to two sentences. Then stick picture of what was studied and let child color (if your child is artistic you could let them draw this on their own). All the pages and pictures you need are included in the student workbook. Review these pages monthly so that your child gets review of what they have been learning.



Other Features:

- You will find vocabulary words scheduled throughout the curriculum. These are designed to be done orally and are completely optional. I have put together vocabulary cards that you can use to aid your student in recall. These can be found at the Elemental Science yahoo group.
- You will also find that before each unit I have included an overview of the study, a list of materials needed by week and a list of simple poems that you can use to help your child memorize the characteristics of animals, plants and the bodies system. These poems are included as a resource for you to enhance your students learning.
- You will find the “Want More?” boxes on each of the plan sheets. These are designed to give you ideas for more activities and for additional reading within the planned books.
- You will also notice that Day 5 is usually planned to be rather light. This is so you can easily fit in additional activities or use the time for nature study. I recommend using the *Handbook of Nature Study*. You could also use day 5 to study the scientists of the ancient time period. I have put together a book called *Great Scientists of the Ancients* that is available for free download at our yahoo group.
- At the back of this guide I have included supplemental materials for you to use along with the program. They included...
 - Animal observation sheets: If you are able to see an animal in its natural habitat you can fill out one of these. These would be great to take along on a trip to the zoo.
 - My Animal Study Book and My Bird Feeder Book: These are templates to use for these projects.
 - Nature Walk Sheets: These are template for you to use to record your Spring and Fall Nature Walks.

- Placement charts: These charts give the possible placement of animals for the habitat posters (templates for these can be found at the Elemental Science yahoo group) and for the food chart.
- Blank pages: These are blank versions of the narration pages and the experiment page in case your student wants to do more!

What if I have an older student? How do I include them?

If you want your older student to work along with your other students and you feel the resources are to “easy” for them. Simply used the following books instead...

- Usborne’s Internet-linked Animal World (or World of Animals)—not all of the animals studied are found in this resource, so you will need to use the internet or books from the library for some of the animals studied
- Usborne’s Internet-linked Human Body
- Usborne’s Internet-linked World of Plants

Have your older child look up the corresponding section in their book and read it, then look up the websites if applicable. I have included a topical index in this guide to aid you in this. Next have them write about the topic. If you want more than just a simple narration, have them write a mini-report (one to two paragraphs) on a separate sheet and paste the picture to that. I would suggest that you let your older student do all their own writing for this program.

As the author and publisher of this curriculum I encourage you to contact me with any questions or problems that you might have concerning Biology for the Grammar Stage at info@elementalscience.com. I will be more than happy to answer them as soon as I am able. You may also get additional help at our yahoo group (http://groups.yahoo.com/group/elemental_science/). I hope that you will enjoy Biology for the Grammar Stage!

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Book List

The following are the books that I used while planning out this curriculum. The encyclopedias are absolutely necessary and I recommend that you purchase these. There are several activities in these that are not scheduled, but feel free to do them as part of your reading time. The books by Janice VanCleave contain almost all of the planned experiments. I recommend that you purchase these or check out a copy from your local library as you will need these if you intend to do the experiment included.

Encyclopedias:

- *Kingfisher First Encyclopedia of Animals (lizard on the cover)*
- *DK First Human Body Encyclopedia*
- *Plant Parts (Life of Plant Series)*

Experiment Books:

- *Janice VanCleave's Science Around the World (SATW)*
- *Janice VanCleave's Biology for Every Kid* (Biology)*

I chose not to include a list of other resources because every library is different. If you want to supplement this curriculum with other books by all means, do! I highly recommend the *Let's Read and Find Out Series* for this age group. Also, your local librarian is an excellent resource and can point you in the direction of some excellent books about the subjects studied.

*A brief word about *Biology for Every Kid*-The explanations for the results of the experiments are a bit over the heads of most children at the grammar stage level. However the experiments themselves are excellent learning tools. You may want to read ahead and just summarize or pull out the important information given to share with your student as they complete the experiment.

Animal Study Overview (20 weeks)

Ongoing activities:

- Habitat project: pick one habitat, make a diorama in a shoebox and add animals as studied.
- Food Chart: add animals studied under Omnivore, Carnivore, Herbivore
- Animal Study (pick one and fill out the My Animal Study book):
 - Raise a frog or butterfly
 - make a worm or ant farm
- Narration Pages: Picture (if possible) and child's summary of what learned
- Experiment Pages: Fill out an experiment page for each experiment performed
- Animal Observation Sheet: When you observe an animal in its' habitat, fill out an observation sheet
- Vocabulary
- Visit Zoo at end of animal study

Books used:

- *Kingfisher First Encyclopedia of Animals*
- *Janice VanCleave's Science Around the World*
- *Janice VanCleave's Biology for Every Kid*

Sequence for Study:

- Week 1
Animal Lives
- Week 2
Habitats (Forests, Grasslands, Desert, Tundra)
- Week 3-20 Animal Study (54 animals)
 - Mammals—8 weeks
 - Birds—4 weeks
 - Reptiles & Amphibians—2 weeks
 - Fish—1 week
 - Invertebrates—3 weeks

Animal Lesson Plans Week 5

Day 1	Day 2	Day 3	Day 4	Day 5
<i>Kingfisher Encyclopedia of Animals Pg.34 (Giraffe)</i>	<i>Kingfisher Encyclopedia of Animals Pg. 35 (Camel)</i>	Experiment: Camels <i>Science Around the World</i> pg. 82 Write-up on SW pg. 53	<i>Kingfisher Encyclopedia of Animals Pg. 38 (Deer)</i>	1. Finish weekly Activities 2. Add Animals to Food Chart 3. Add Animals to Diorama
Narration Page SW pg. 19 (pictures pg. 82)	Narration Page SW pg. 19 (pictures pg. 82)		Narration Page SW pg. 19 (pictures pg. 82)	
Pretend to be the Animal Studied If Possible: Observe Animal in their Natural Habitat, fill out Observation Sheet				

Notes:

Teacher's Guide sample

Supplies Needed:

- 4 x 4 piece of cardboard
- 1 cup sand or salt
- Dime, large jar lid

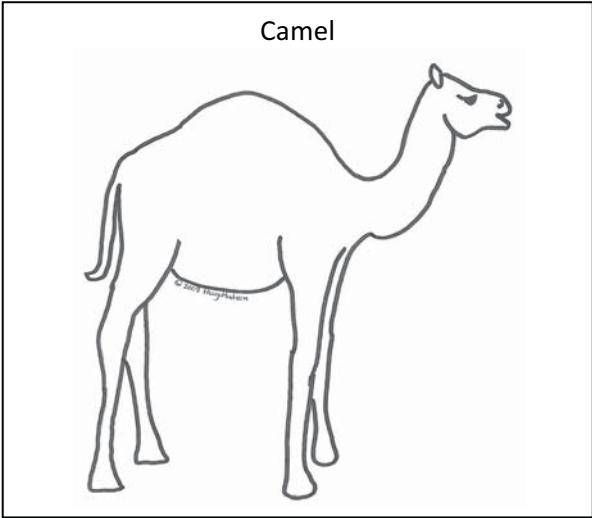
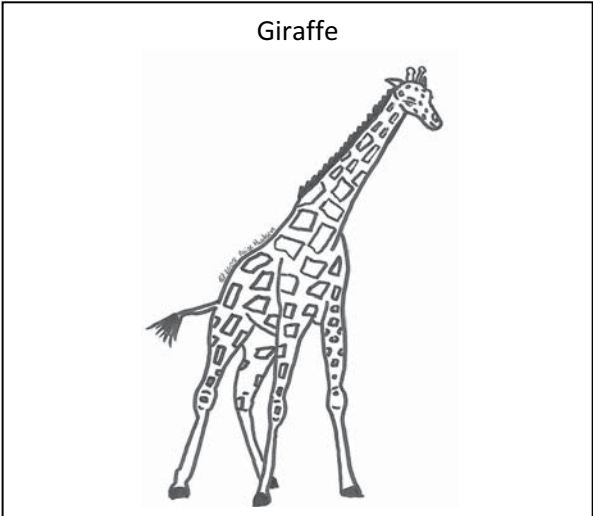
Experiment: Camels

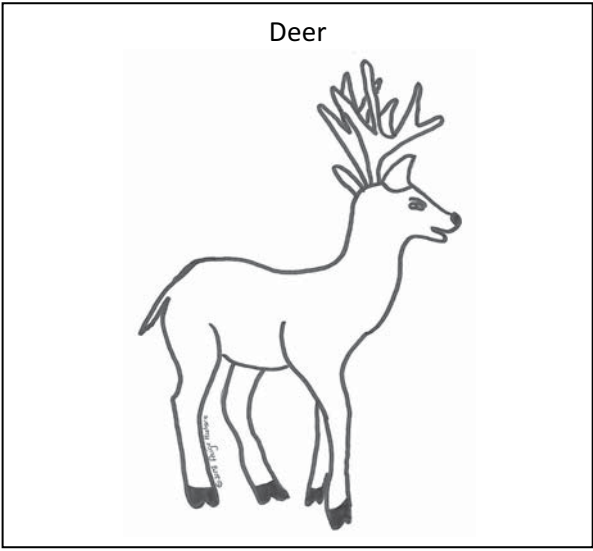
See *Janice VanCleave's Science Around the World* pg. 82-83. This experiment will help your student see the how the way a camel's toes are designed helps them to carry heavy loads across the soft desert sand.

Want More?

- Read about...
Antelope
Buffalo
Llama
Elk
Reindeer
- Do the additional experiment described in *Science Around the World* on pg. 83.
- Continue working on poem

Pictures are included here in this sample of the student workbook, but in the program they are on a separate sheet to be cut out and colored by child, then pasted in these squares.





Name: _____

Date: _____

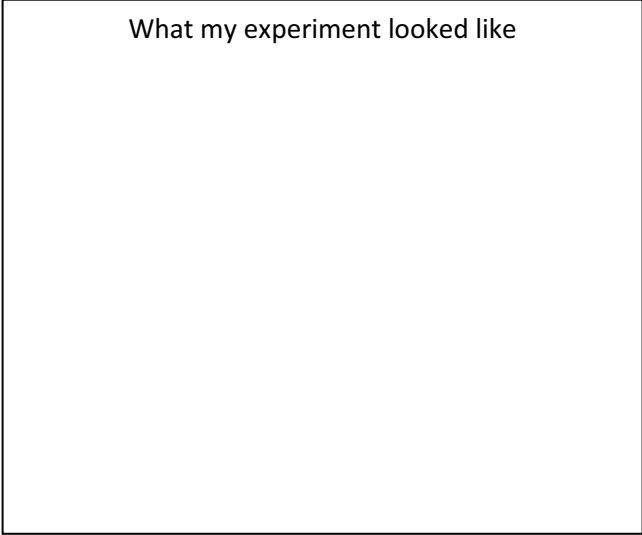
Camels: How do camels walk across the sand without sinking?

Procedure (What we did):

From the Student Workbook

Hypothesis (What I think will happen):

What my experiment looked like



Results (What happened):

Conclusion (What I learned):

Human Body Study Overview (10 weeks)

Ongoing Activities:

- The Body Project—Paste the parts of the human body on the outline as you learn about them throughout the 10 weeks
- Narration Pages: Picture if possible and child's summary of what learned
- Experiment Pages: Fill out an experiment page for each experiment performed
- Vocabulary

Books Used:

- *DK First Human Body Encyclopedia*
- *Janice VanCleave's Biology for Every Kid*

Sequence for Study:

- Week 1—Basic Building Blocks
- Week 2—Skeletal System
- Week 3—Muscular System
- Week 4—Nervous System
- Week 5—Senses
- Week 6—Circulatory System
- Week 7—Respiratory System
- Week 8—Digestive System
- Week 9—Urinary & Reproductive Systems
- Week 10—Immune System

Human Body Lesson Plans Week 1

Day 1	Day 2	Day 3	Day 4	Day 5
<i>DK First Human Body Encyclopedia</i> pg. 4-5 (<i>Your Amazing Body</i>)	<i>DK First Human Body Encyclopedia</i> pg. 8-9 (<i>Building Blocks</i>)	<i>DK First Human Body Encyclopedia</i> pg. 68-69 (<i>All Wrapped Up</i>)	Experiment: Fingerprints <i>Biology</i> pg. 176 Write-up on SW pg. 66	<i>DK First Human Body Encyclopedia</i> Pg. 72-73 (<i>Fairly Hairy</i>)
Introduce the body project	Narration Page SW pg. 35 (Pictures pg. 88)	Narration Page SW pg. 35 (Pictures pg. 88)		Narration Page SW pg. 35 *(see below)
Introduce Vocabulary	Look for it!			Oral Vocabulary Test

Notes:

Supplies Needed:

- Pencil
- Clear tape
- Magnifying glass

Vocabulary:

- Cell—your body is made up of billions of these tiny, living units

Experiment: Fingerprints

See *Janice VanCleave's Biology* pg. 176-177 This experiment will help your student to observe patterns in their fingerprints. (Just paste the fingerprints on your experiment sheet instead of a separate sheet of paper)

The Body Project:

This is an ongoing project. Every week you will paste the parts of the body you are learning about onto the outline. You can do this at the end of the week while doing an oral review of what you have learned (ie. Do you remember what this part for?) This project will continue through week 9. The only thing to add in week one is hair, which can be drawn on by your student.

Day 5—Narration Page: have your student draw their own hair on the head on the narration page

Want More?

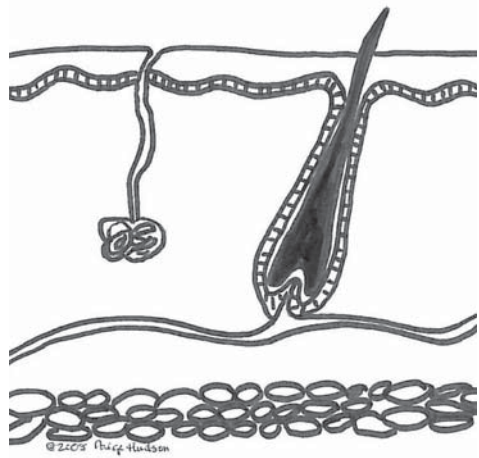
- Read about...
Organization of the Body
At your fingertips
- Make a jello cell mold of the cell.
- For the body project: You could make a life size version of this. Just trace your child's body. Then use a copier to blow up the parts found in the student guide to fit your life size body.
- Begin memorizing the Human Body poem

Pictures are included here in this sample of the student workbook, but in the program they are on a separate sheet to be cut out and colored by child, then pasted in these squares.

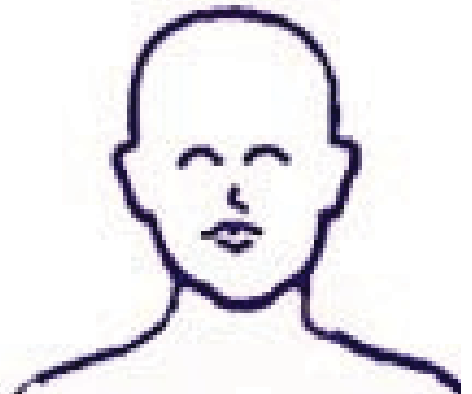
Cells



Skin



Hair



Name: _____

Date: _____

Fingerprints

Are there patterns in my fingerprints?

Procedure (What we did):

From the Student Workbook

My fingerprints

My observations:

Conclusion (What I learned):

Plant Study Overview (6 weeks)

Ongoing Activities:

- Plant Growth Project:
Begin by planting your seed. Record the growth at the end of each week, for the six weeks of the plant study.
- Take Nature walks:
When you take a nature walk, if possible pick the flowers you find, take them home and press them. Identify the flower you found using a wildflower guide book from the library or from the internet. Record you finding on the Spring Nature Walk Summary Sheet. If you are doing this unit in the fall I have included and fall version of the Nature Walk Summary. Simply collect leaves and press them instead of the flowers
- Narration pages: Picture if possible and child's summary of what learned
- Experiment Pages: Fill out an experiment page for each experiment performed
- Vocabulary

Books Used:

- *Plant Parts (Life of Plant Series)*
- *Janice VanCleave's Biology for Every Kid*

Sequence for Study:

- Week 1—leaves
- Week 2—flowers
- Week 3—fruit/seeds
- Week 4—nuts/cones/spores
- Week 5—stems
- Week 6—roots/review of parts

Plant Lesson Plans Week 3

Day 1	Day 2	Day 3	Day 4	Day 5
<i>Plant Parts</i> Pg. 18-19 (Fruit)	<i>Plant Parts</i> Pg. 20-21 (Why Plants Have Fruit)	<i>Plant Parts</i> Pg. 22-23 (Seeds)	Experiment: Baby bean <i>Biology</i> Pg. 42 <i>*pre-soak beans*</i> Write-up on SW pg. 77	<ol style="list-style-type: none"> 1. Finish weekly activities 2. Take a nature walk, press and record flowers found 3. Record Growth of Plant on chart
Narration Page SW pg. 46 (Pictures pg. 90)	Narration Page SW pg. 46 (*see below)	Narration Page SW pg. 46 (Pictures pg. 90)		
Introduce Vocabulary	Look for it!			Oral Vocabulary Test

Notes:

Things to Do:

- Soak beans for 24 hours before Day 4 Experiment

Supplies Needed:

- 4 or 5 dry pinto beans
- Jar
- Paper towel

Vocabulary:

- Seed—part of the plant that contains the beginnings of a new plant

Experiment: Baby bean

See *Janice VanCleave's Biology* pg. 42-43, this experiment will help your student identify the parts of the seed.

Day 2: Narration—written only, no picture

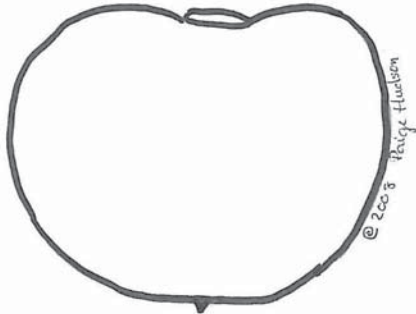
Want More?

- Examine different fruits to see what types of seeds they have and where they are located.
- Choose different types of seeds to soak and dissect. Observe and discuss the differences.
- Continue working on the poems

Pictures are included here in this sample of the student workbook, but in the program they are on a separate sheet to be cut out and colored by child, then pasted in these squares.

Fruit

A tomato is



a fruit.

Why do plants have fruit?

Seeds