

FOUR FAMOUS SCIENTISTS

Grade Level or Special Area: Fifth Grade

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Length of Unit: Four lessons (60 minutes each – with work to be completed at home)

I. ABSTRACT

Your Fifth Graders will take a trip back in time to visit the lives of four famous scientists. Through observation of “fanny packs” that belonged to these famous men, students will learn how Galileo got himself into big trouble, how Julian set an example for black scientists everywhere, how Just overcame prejudice to give science vital information needed for a lifetime, and how Linnaeus took the confusion out and affected the way we organize today. They will be inspired to study more and will look forward to making discoveries on their own throughout the school year.

II. OVERVIEW

A. Concept Objectives

1. Students understand that science involves a particular way of knowing and understanding common connections among scientific disciplines. (*Colorado Model Content Standards for Science*, Standard 6)
2. Students recognize that literature is a record of human experience. (adapted from *Colorado Model Content Standards for Reading and Writing*, Standard 6)

B. Content from the *Core Knowledge Sequence*

1. Fifth Grade: Science (p. 129)
 - a. Science Biographies
 - i. Galileo
 - ii. Percy Lavon Julian
 - iii. Ernest Just
 - iv. Carl Linnaeus

C. Skill Objectives

1. Students will learn about and discuss the scientific contributions that are made by individuals of diverse backgrounds, interests, talents, and motivations. (adapted from *CMCS for Science*, GLE 6.5.5)
2. Students will read, respond to, and discuss a variety of ...non-fiction... (adapted from *CMCS for Reading and Writing*, GLE 6.5.1)
3. Students will read, respond to, and discuss literature that represents points of view from places, people, and events that are familiar and unfamiliar. (*CMCS for Reading and Writing*, GLE 6.5.2)

III. BACKGROUND KNOWLEDGE

A. For Teachers

1. *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 195-205
2. *Carl Linnaeus: Father of Classification*, by Margaret J. Anderson
3. *Scientists Who Made History: Galileo Galilei*, by Mike Goldsmith

B. For Students

1. No background information is necessary for students for this unit.

IV. RESOURCES

- A. *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 195-205 (Lessons One – Four)

- B. *Scientists Who Made History: Galileo Galilei*, by Mike Goldsmith (Lesson One - optional)
- C. *Galileo*, by Leonard Everett Fisher (Lesson One - optional)
- D. *Starry Messenger: Galileo Galilei*, by Peter Sis (Lesson One)
- E. *Great Black Heroes: Five Brilliant Scientists*, by Lynda Jones, pp. 23-39 (Lessons Two – Three)
- F. *The African-American Century: How Black Americans Have Shaped Our Country*, by Henry Louis Gates, Jr. and Cornel West, pp. 103-105 (Lesson Three)
- G. *Carl Linnaeus: Father of Classification*, by Margaret J. Anderson (Lesson Four)

V. LESSONS

Lesson One: Galileo: A Man with his Head in the Clouds? (60 minutes + outside class project)

A. Daily Objectives

1. Concept Objective(s)
 - a. Students understand that science involves a particular way of knowing and understanding common connections among scientific disciplines.
 - b. Students recognize that literature is a record of human experience.
2. Lesson Content
 - a. Science Biographies
 - i. Galileo
3. Skill Objective(s)
 - a. Students will learn about and discuss the scientific contributions that are made by individuals of diverse backgrounds, interests, talents, and motivations.
 - b. Students will read, respond to, and discuss a variety of ...non-fiction...
 - c. Students will read, respond to, and discuss literature that represents points of view from places, people, and events that are familiar and unfamiliar.

B. Materials

1. Student copies of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 195-197
2. *Scientists Who Made History: Galileo Galilei*, by Mike Goldsmith (optional)
3. *Galileo*, by Leonard Everett Fisher (optional)
4. *Starry Messenger: Galileo Galilei*, by Peter Sis – **Cover book with brown paper so students cannot see the cover while you read!**
5. Wall map of Europe, with Pisa, Italy labeled
6. One “fanny pack” filled with the following items (*) and placed in a crumpled old shopping bag
7. *Small crucifix – to represent the Catholic church
8. *Small Bible
9. *Small Italian flag
10. *Appendix A - Birth Certificate showing the year 1564
11. *Several pennies and nickels
12. *Stethoscope (child’s toy is fine!)
13. *Small calculator
14. *Medium sized rock (must weigh more than the stone below!)
15. *Very small pebble or stone
16. *Small pendulum from a clock (a drawing or catalog picture will do if you can’t find one)
17. *Small child’s toy telescope or spyglass

18. Portrait of Galileo to post in room (optional – if available)
19. Student copies of Appendix B – Galileo Project, pages 1-2, to give to students
20. Student copies of Appendix C – Galileo Review (two pages)
21. Student copies of Appendix B – Rubric to be used for grading projects on due date
22. One piece of sturdy poster board, cut to 14” x 22” (half sized), for each student – can be white or colored, depending upon your preference

C. *Key Vocabulary*

1. Philosophy – the study of truth, wisdom, the nature of reality, and knowledge; a person’s philosophy is his/her basic ideas and beliefs on how life should be lived.
2. Renaissance – the revival of art and learning in Europe between the 14th and 16th centuries; it was inspired by an interest in the ancient Greeks and Romans
3. Reformation – the effort in the 16th century to reconstitute the life and teaching of Western Christianity, resulting in the separation of the Protestant churches from the Roman Catholic Church

D. *Procedures/Activities*

1. **Note to teacher before beginning this unit:** This unit was written to be taught one of two ways. You may either teach it as one complete unit covering all of the scientists at one time, or you may choose to teach each lesson independently to coordinate with the unit of study in History or Science to which they are related. If you choose to do it as one complete unit, you will either need to make the projects optional, or give students extra class time to complete them, adding extra days to the length of this unit.
2. Introduce this unit by telling students that over the summer, you had the privilege of doing some antiquing in some small quaint villages. Tell them that you happened upon a very interesting item while you were rummaging through things in the back of an old shop. Reach into your bag and produce the “fanny pack” filled with the various items listed above.
3. Explain to students that when you found this “fanny pack” you noticed a name inscribed on the inside in what you thought was Italian. You inquired of the shop owner and you were told in very broken English that “it was indeed Italiano and was found in a small house near the city of Pisa, in Italy.” (Use your best Italian accent when telling this story!)
4. Pull down the map and point to the area of the world where Pisa, Italy is. Ask students what continent Italy is located on. (Europe) Ask if they know how old some of the cities and countries in Europe are. (They should say very old. America is only about 230 years old, but the Romans lived in Europe, and the Vikings! Make a big deal of how old some places in Europe actually are!) Impress upon students that this “fanny pack” is indeed extremely old, and that inside it are some very interesting things that will tell us a very interesting story today about someone very important to our study of Science.
5. Using your Italian accent again, remind students of the name inscribed inside the pack. “Remember, I told you I had seen a name inside this pack. Would you like to know whose name it is?” (Hopefully students will be anxious to know!)
6. Tell them, “No, I cannot tell you quite yet, but I would like to show you some of the other things I found in this pack, and then you see if you can figure out to whom they belonged!”
7. Carefully pull out the small Bible. Ask students if anyone knows what it is. When a student says, the Bible, be affirmative and tell students that this person lived during a time when the Bible, or the church, was very important in people’s lives, even probably more so than it is in America today. Explain that the church

had great authority in the time that this person lived and in the area of the world that this person lived.

8. Next, pull out the crucifix. Again, ask for responses as to what it is. Students may say a cross. Tell them that yes, it is a cross, but a special kind of cross. If no one can tell you what it is, explain to them that it is called a crucifix, and then see if anyone can tell you what church associates itself with this type of cross. If no one knows, explain that this is a very important symbol for one major church, the Catholic Church. There are other churches that hang these as symbols of their religion, but it is most often associated with the Catholic Church.
9. Explain to students that the Catholic Church specifically had a great deal of authority and power in the land this person lived in. Remind students of how powerful the church was in England, for instance, and why the Pilgrims and others left there to get away from the rules and regulations and things they thought were wrong with the church there several centuries ago.
10. Now, pull out the Italian flag. Students may or may not have ever seen one of these. See if anyone can figure out what country this flag is from. Remind students if they do not figure it out, that you had seen what you thought was Italian writing inside the pack. Students should now guess the flag is from Italy.
11. Explain to students that the person who owned this pack was indeed from Italy, from Pisa, the place they located on the map earlier. Tell them that he was born there around the same time period that the Spanish explorers that they have studied in previous years had come to explore the continents of North and South America. Columbus was probably already dead when this person was born, or may have died soon after, but some other famous people were around. A guy named Shakespeare was busy writing some interesting stuff in this person's lifetime. See if students can figure out about the right time period. (1500-1600's)
12. Pull out the birth certificate and tell students that this person was born in 1564. Pull out the pennies and nickels and explain that he was born into a family that was not very financially well to do. Tell them that his father was a musician who wanted so much more for his son.
13. Pull out the stethoscope. Ask students if they can figure out what this person's father wanted him to become? (to study medicine) Take out the calculator and explain to students that instead of medicine, this man was more interested in Mathematics and Philosophy, so he took courses in these areas instead.
14. Explain to students that at this time, there were lots of philosophers. Ask if they can tell you what philosophy is. Discuss this with students and put the definition from above on the board for students to think about.
15. Explain to students that at this time, Europe was going through lots of changes. Europe had just come through a time period that we call the Renaissance. Again, ask if anyone can explain what the Renaissance was. Write the definition on the board as well.
16. Tell students that many people were thinking in ways during this time that they had not thought before. Students should remember the Dark Ages and the Medieval Times from Fourth Grade. The Renaissance was a great "awakening" of sorts from this very dark and dismal time in Europe. New ideas were being thought of and people were challenging things that had always been accepted in the society of kings and nobles in which they had lived. During this time, people started thinking for themselves and stopped letting others, especially the church, tell them what to think or do. After this time, Europe started changing dramatically and went into what we now call a period of Reformation, or a time

- when the ideas of the Roman Catholic Church were challenged and the church was never the same again.
17. Anyway, back to our mystery person! Tell students that this person was very interested in philosophy. He started reading the works of the ancient Greek philosopher Aristotle who had lived from about 384-322 B.C. He started questioning some of his theories and trying to prove them wrong himself.
 18. At this time, take out the rock and the pebble. Tell students that one thing that Aristotle had said that this person proved wrong had to do with his theories of motion. Using the rock and the pebble, show students, by standing up on a chair and dropping the two items at the same time, that they will both hit the floor at the same exact time. He proved that all bodies would fall at the same speed, regardless of how heavy or light they were.
 19. Take out the pendulum. Tell students that he was also very interested in how pendulums worked and spent a great deal of time studying them to improve the ability of clocks to tell time accurately.
 20. Tell students that there were lots of other things that this person did, but that there was one invention that he was best known for, and that you would like to read them a story about this now, to see if they can figure out who he was.
 21. Using your **brown paper covered version** of *Starry Messenger: Galileo Galilei*, by Peter Sis, read this entire story to students, **leaving out Galileo's name** throughout the book. You can show students the artwork in the book, as it is beautiful, but do not stand close enough for them to see his name!
 22. Take the toy telescope out of your fanny pack at this time and ask if anyone knows who this famous scientist was. If students have not figured it out, explain that his name was Galileo Galilei. Display a portrait of Galileo for students at this time.
 23. Talk with students after reading this book about the fact that Galileo was indeed a very learned and brilliant man. He did many wonderful things for science. Point out how the church that persecuted him for his beliefs actually stopped the advancement of knowledge for a very long time. Explain to students how important it is that people are allowed to share their ideas and how those ideas often point to new discoveries. Remind them that it took the church in Europe over 300 years to admit that Galileo was correct in his ideas. Ask students if the churches persecution of Galileo stopped Galileo from thinking? No, he continued to study his science and he continued to make new discoveries, and he continued to share them and his ideas have lived on.
 24. There are two other great books about the life of Galileo if you want to extend this lesson and share either one of them with your class. You could also just have them available for them to read on their own. *Galileo*, by Leonard Everett Fisher and/or *Scientists Who Made History: Galileo Galilei*, by Mike Goldsmith could be shared with students at this time. The book by Fisher is more of a picture/story book. The one by Goldsmith is more of a factual, non-fiction book, but it has great quotes by Galileo throughout and a wonderful timeline at the back that are worthy of your time. The Fisher book also puts Galileo in the proper perspective of the Reformation in Europe, and this will be helpful if you choose to do this section of the lesson in conjunction with your study of this historical time period.
 25. After finishing your discussion about these books, hand out student copies of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 195-197
 26. Have students either read this silently or aloud together as a class as review of what you have already discussed. Students may use highlighters as they read to

highlight information that they think is important to remember about their study of Galileo.

27. Tell students that as a culmination to this mini-lesson on Galileo, they will be given an opportunity to do some work on their own to produce a product for presentation to the class about Galileo and how his work is vitally important to our study of science and also to the time period of the Renaissance and Reformation.
 28. Hand out student copies of Appendix B – Galileo Project, pages 1-2. Explain to students that this page lays out the expectations of what they will do for this Galileo mini-poster project. Go over the paper with your class and provide poster board for their use. Set a date with students for turning in their projects. You may choose to do this as an in-class project or assign it as a home project. Also go over the rubric for grading this project with your students so that expectations and requirements are clear.
 29. At the end of class, hand out student copies of Appendix C, pages 1-2 – Galileo Review. Have students complete this worksheet in class if time allows, using their copy of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 195-197. If class time does not allow, you can have them complete this for homework or finish up during the next class period.
 30. Encourage your students to get started early on completing their projects and remind them of the due date you set, daily, to keep them on track with their progress.
- E. *Assessment/Evaluation*
1. Student completion of Appendix C – Galileo Review will be graded
 2. Student completion of Appendix B – Galileo Project graded according to rubric

Lesson Two: Percy Lavon Julian: Don't Spill the Beans! (60 minutes + outside class project)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students understand that science involves a particular way of knowing and understanding common connections among scientific disciplines.
 - b. Students recognize that literature is a record of human experience.
 2. Lesson Content
 - a. Science Biographies
 - i. Percy Lavon Julian
 3. Skill Objective(s)
 - a. Students will learn about and discuss the scientific contributions that are made by individuals of diverse backgrounds, interests, talents, and motivations.
 - b. Students will read, respond to, and discuss a variety of ...non-fiction...
 - c. Students will read, respond to, and discuss literature that represents points of view from places, people, and events that are familiar and unfamiliar.
- B. *Materials*
1. Student copies of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 198-200
 2. *Great Black Heroes: Five Brilliant Scientists*, by Lynda Jones, pp. 33-39
 3. One “fanny pack” filled with the following items (*)

4. *Graded Math Test with a grade of 80% on the top in large red print – folded up to fit in a pocket – put the name Percy Julian on top in juvenile handwriting and date it sometime in 1909
5. *Magnet or small map of State of Alabama
6. *“Colored’s Only” sign on paper, rolled up – Appendix A, page 2
7. *Magnet or small map of State of Indiana
8. *Can of shoe polish
9. *Graduation diploma from DePauw University – Appendix D
10. *One small apple
11. *Magnet or small map of Massachusetts
12. *Small plastic test tube
13. *Small ship model
14. *Small baggie of soybeans
15. *Fake eyeball
16. *Wedding ring
17. *Paint brush
18. *Baby pacifier
19. *Cortisone cream tube
20. *Quote poster – Appendix E
21. Student copies of Appendix F, pages 1-2 – Julian Project
22. Student copies of Appendix G, pages 1-2 – Julian Review – **cover answers before copying**
23. Student copies of Appendix F, page 2 for use in grading Julian Projects on due date
24. Small mini-booklets for each student; these should be made ahead of time of two sheets of 8 ½” X 11” white paper folded the hamburger way and one sheet of light colored construction paper for a cover and stapled together; this will create an 8 page booklet with cover

C. *Key Vocabulary*

1. Valedictorian –a student of the highest academic standing in the class, who gives a speech at graduation
2. Master’s degree – a college degree given to someone who has taken one more year of study after graduating from a regular four year college program
3. Ph.D. – Doctor of Philosophy; a degree given to someone who has taken even more college classes after a Master’s degree and been especially approved for research work they have done in their field
4. Vienna – a large city in Austria
5. Synthesize – to combine things to form a new product
6. Soybean – a bean plant originally from Asia that is planted to improve soil, and for its nutritious edible seeds
7. Hormones – chemicals made by certain glands in your body that affect the way you grow and develop
8. Steroid – a chemical substance found naturally in plants and animals, including humans; some are made artificially and can be used for medicines and treatment of injuries or illnesses; some are being used illegally to improve athletic performance and are harmful to the body

D. *Procedures/Activities*

1. Introduce today’s lesson by telling students that you had a chance to go antiquing over the summer and you found something very interesting in the back of a shop you were in somewhere near Montgomery, Alabama. Tell them it was buried deep in the bottom of a box, and the shop owner hadn’t even been aware that he

had it. (If you have already taught the lesson on Galileo, you will need to change your wording a bit so students know you got this at the same time as the other one!)

2. At this time, bring your large shopping bag out from under the desk or table and reaching down inside, produce the “fanny pack” for Percy Lavon Julian. Tell students that after looking through this pack, you found some very interesting items that belonged to a very famous, black scientist who contributed a great deal to the field of medicine in the 1900’s.
3. Open the pack carefully and pull out the folded Math test. Tell students that the reason you knew who this fanny pack belonged to was that you found this very old Math test in it. Show students the test and tell them that Percy was very excited when he made an 80% on his test. He ran home to tell his father, and his father told him that was pretty good, but next time, he wanted to see a 100%. Ask students how many of them have heard this kind of response from their parents before. Ask them how it made them feel. (Some may say it made them feel bad, and some may say it inspired them to work harder.)
4. Tell students that this comment inspired Percy Julian to work even harder and it helped him to understand at a very early age that his parents had very high expectations for his success in school and in life.
5. Next, take out the small magnet or map of the state of Alabama. Tell students that Percy was born the state of Alabama in 1899. Ask students if they have ever heard of Montgomery, Alabama. Chances are they will have heard of it if they have studied about Dr. Martin Luther King, Jr. or anything at all about the Equal Rights Movement. Tell students that there were very few opportunities for black children to succeed in Montgomery when Percy was young. Pull out the “coloreds only” sign and post it on the wall.
6. Explain to students that when Percy was young, black children were not allowed to go to school with white children. They were also not allowed to go to school after eighth grade. Percy’s mother helped him finish his education and after a lot of hard work and support from his family, Percy got accepted to go to college. Pull out the magnet of Indiana.
7. Tell students that the college Percy went to was DePauw University in Greencastle, Indiana. This was not an all black school. In fact, Percy was the only black student there! Again, ask students how they think this might make them feel. Take out the can of shoe polish.
8. Tell students that Percy had to work very hard in college. He didn’t have a lot of money to pay for his education. His parents helped him as much as they could, but he had to work at a lot of different jobs in order to pay for his schooling. One of the jobs he had was being a shoeshine boy. He was also a waiter for a while and a ditch digger during the day so he could take classes at night. Take out the college diploma.
9. Percy Julian’s hard work paid off when he graduated from DePauw University in 1920. He was the valedictorian of his class and was chosen to give the farewell speech to his class. Take the apple out.
10. Tell students that Julian’s teachers at DePauw told him he would have a hard time getting a good job because he was black, but they didn’t know how persistent he could be. Soon he got a teaching job at Fisk University in the chemistry department. Take out the magnet or map of Massachusetts.
11. Tell students that after working at Fisk for a few years, Julian got accepted to Harvard University, in Cambridge, Massachusetts. Take out the test tube. A year after he began, Julian received his Master’s degree in organic chemistry.

- After this, he still had a hard time getting a good job because he was black, but he taught for a few years at two black schools. Take out the small ship.
12. Tell students that like many black scientists, Julian found that he would be allowed to do a lot more with his education and his ideas if he went to Europe to study, so he boarded a ship and traveled to Vienna, Austria. In 1931, he received his Ph.D. from the University of Vienna for his research on chemicals found in plants. Take out the soybeans.
 13. While he was in Vienna, Dr. Julian made an important discovery. He figured out that soybeans could be used for medical purposes. He wanted to experiment more with these beans so he went back to DePauw University in Indiana. Take out the fake eyeball.
 14. While he was here he also studied the chemicals in a plant called the Calabar bean, which was a poisonous seed from a plant native to Africa, and was able to synthesize a chemical called physostigmine, which is now used to treat an eye disease that causes blindness, called glaucoma. Take out the wedding ring.
 15. In December of 1936, Dr. Julian got two really important additions to his life. The first was his wife, Anna Johnson, whom he married the day before Christmas, and the second was his new job with the Glidden Company. Take out the paint brush. The Glidden Company made paints and varnishes. Julian had decided to leave DePauw University because they still would not make him a professor because he was black, and he was excited about becoming the director of research at Glidden. Julian stayed at Glidden for 17 years. Take out the pacifier.
 16. During that time, Dr. Julian and his wife had two children, Percy, Jr. and Faith. While he worked at Glidden, Dr. Julian used soybeans to make many things. He created a product called *Aero-foam*, a chemical that puts out oil and gas fires. This product has been very useful to us and is still used today. It also saved many soldiers lives during WWII.
 17. Also, while Dr. Julian was at Glidden, an accident occurred and water somehow leaked into the tanks that held his purified soybean oil. When the oil mixed with the water, it created a solid. Dr. Julian was able to separate this solid out of the mixture to analyze it. He ended up being able to synthesize two different human hormones, which then went on to be used in treating medical problems and also in creating birth control pills and a drug that could help save babies that might be born early due to hormone problems the mother might have. Take out tube of Cortisone.
 18. Dr. Julian also worked at this time with some doctors from the Mayo Clinic in Chicago who had just figured out that a substance called cortisone, which came from the glands of oxen and was extremely expensive, could be used to treat things like rheumatoid arthritis. It could also be used for other types of pain caused from injuries and swelling. Julian had been working with sterols from soybeans and was able to start synthesizing pounds of cortisone very inexpensively.
 19. In 1954, Dr. Julian left Glidden to start his own company which he called Julian Laboratories, Inc. He had offices in Chicago and in Mexico. His company was very successful and after six years, he sold his business and made millions of dollars!
 20. Percy Lavon Julian received many awards and honors for his work. He also fought for equal rights for Blacks and women and organized other Black professionals to raise money to support the civil rights movement. He helped many generations of blacks and helped build a world where scientists could get

jobs based on their skills instead of their skin color. Take out quote poster and post in front of room.

21. Tell students that Dr. Julian had a famous quote that he used often when he was receiving honors for something that he did. He used to say, "I would forever fight to keep hope alive." Explain to students that this quote summed up his persistence as a scientist and his success in the area of medical research and treatment was a result of his determination and spirit.
 22. Dr. Julian died on April 19, 1975.
 23. Hand out student copies of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 198-200 and read together as a review of the information shared in class.
 24. Hand out student copies of Appendix G - Julian Project, pages 1-2. Explain to students that this page lays out the expectations of what they will do for this Julian mini-book project. Go over the paper with your class and provide mini-books for their use. Set a date with students for turning in their projects. These may be done as in class projects or assigned as at home projects. Go over the rubric on page 2 with students so that expectations and requirements are clear.
 25. At the end of class, hand out student copies of Appendix H - Julian Review and have students complete this worksheet in class if time allows, using their copy of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 198-200. If class time does not allow, you can have them complete his for homework or finish up during the next class period.
 26. Encourage your students to get started early on completing their projects and remind them of the due date you set, daily, to keep them on track with their progress.
- E. *Assessment/Evaluation*
1. Student completion of Appendix G - Julian Review will be graded
 2. Student completion of Appendix H - Julian Mini-Book Project graded according to rubric

Lesson Three: Ernest Everett Just: Call Me on the Cell! (60 minutes + outside class project)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students understand that science involves a particular way of knowing and understanding common connections among scientific disciplines.
 - b. Students recognize that literature is a record of human experience.
 2. Lesson Content
 - a. Science Biographies
 - i. Ernest Just
 3. Skill Objective(s)
 - a. Students will learn about and discuss the scientific contributions that are made by individuals of diverse backgrounds, interests, talents, and motivations.
 - b. Students will read, respond to, and discuss a variety of ...non-fiction...
 - c. Students will read, respond to, and discuss literature that represents points of view from places, people, and events that are familiar and unfamiliar.
- B. *Materials*
1. Student copies of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 201-203

2. *Great Black Heroes: Five Brilliant Scientists*, by Lynda Jones, pp. 23-31
3. Student copies of Appendix H, pages 1-2 – Ernest Just Review
4. Student copies of Appendix I, pages 1-2 – “Just” Another Project
5. Student copies of Appendix I, page 2 for use in grading projects on due date
6. One “fanny pack” filled with the following items (*)
7. *Magnet or small map of South Carolina
8. *Small tree (train set sized)
9. *Coloreds only sign – Appendix A, page 2
10. *Magnet or small map of New Hampshire
11. *Small apple
12. *Small whales or sea creatures
13. *Wedding ring
14. *Plastic white egg
15. Eight index cards per student and eight rectangular pieces of construction paper in the colors listed on Appendix I, page 1, cut just a bit larger than the index cards

C. *Key Vocabulary*

1. Biology – the scientific study of living things
2. Zoology – the science that deals with the study of animal life
3. Cytology – the study of cells
4. Embryology – the science dealing with the formation, early growth, and development of living organisms
5. Fertilization – to bring reproduction in an egg or a plant by causing sperm to join with the egg or pollen to come into contact with the reproductive part of the plant
6. Cell – the basic structure of all living things

D. *Procedures/Activities*

1. Introduce today’s famous scientist by taking out your brown shopping bag and removing your “fanny pack” for Ernest Everett Just. Tell students that you were able to find his fanny pack this summer when you traveled to the Gullah Islands down in South Carolina. Using the map, point out the state of South Carolina and tell students that the gentleman they will study today came from the Deep South. Explain that you will be reading a story to the class today about Mr. Just and showing them just a few things from his “fanny pack” to help them remember about him.
2. Read to students from *Great Black Heroes: Five Brilliant Scientists*, by Lynda Jones, pp. 23-31. This book is very easy, so take your time and expound upon the reading as you discuss the items in the fanny pack throughout.
3. Before reading p. 23, show students the magnet or small map of South Carolina. Show them where St. James Island is off the coast of South Carolina.
4. Before reading the 3rd paragraph on page 24, show students the small tree from the pack. Read and explain that Just loved to walk in the woods in Maryville and was fascinated by the flowers and animals and was very interested in how things *began!*
5. Put up the “coloreds only” sign now and read on about only Black schools being available for Just to attend. Show students the magnet of New Hampshire and read p. 26 about him going to school at Kimball Academy. Continue on with the information about Dartmouth on pp. 26-27. Show the apple before reading the 2nd paragraph on p. 27 and point out to students that Ernest became a teacher because he couldn’t get a job in science because he was black. Show students the small whales or sea creatures.
6. Read pages 27-28 and talk about him working at the Marine Biological Lab, in Wood’s Hole. Show the wedding ring.

7. Read page 29 and talk about his marriage at this time. Show the egg.
 8. Finish reading pp. 29-30. Talk about his research with the eggs of the sea animals and how this taught scientists so much about the cell. Finish reading pages 30-31 and discuss his difficulties and death with students. Answer any questions students might have at this time.
 9. When you are finished reading, hand out student copies of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 201-203. Also hand out student copies of Appendix H, pages 1-2 – Ernest Just Review. Put students in groups of two or three. Instruct them to read *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 201-203 together and then use it to complete Appendix H, pages 1-2. Collect these when students have completed them.
 10. At the end of class, hand out student copies of Appendix I, pages 1-2 – “Just” Another Project. Read over these pages completely with students to make sure they understand their assignment. Set a date with students for turning in their completed project.
- E. *Assessment/Evaluation*
1. Student completion of Appendix H, pages 1-2 – Ernest Just Review graded
 2. Student completion of Appendix I – “Just” Another Project by assigned due date graded according to rubric on Appendix I, page 2

Lesson Four: Carl Linnaeus: I Can Name That Plant in Two Words! (60 minutes + outside class project)

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Students understand that science involves a particular way of knowing and understanding common connections among scientific disciplines.
 - b. Students recognize that literature is a record of human experience.
2. Lesson Content
 - a. Science Biographies
 - i. Carl Linnaeus
3. Skill Objective(s)
 - a. Students will learn about and discuss the scientific contributions that are made by individuals of diverse backgrounds, interests, talents, and motivations.
 - b. Students will read, respond to, and discuss a variety of ...non-fiction...
 - c. Students will read, respond to, and discuss literature that represents points of view from places, people, and events that are familiar and unfamiliar.

B. *Materials*

1. Student copies of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 204-205
2. *Carl Linnaeus: Father of Classification*, by Margaret J. Anderson
3. One inexpensive “fanny pack” per student (these can be purchased from Oriental Trading Company at <http://www.orientaltrading.com> and at present they are item number HK-16/257 for \$13.95 a dozen; these are not very large, however and you might want students to provide their own instead)
4. A large bucket of various and sundry items, different sizes, colors, textures, etc.- just empty out your junk drawer!
5. Student copies of Appendix I, pages 1-2 – Carolus Linnaeus Review
6. Student copies of Appendix K, pages 1-2 - Carolus Linnaeus’s Fanny Pack Found! Project

7. Student copies of Appendix K, page 2 – Carolus Linnaeus’s Fanny Pack Found! Project Rubric to be used in grading final presentations
- C. *Key Vocabulary*
1. Mayhem – a situation of confusion or violent destruction
 2. Species –one of the groups into which animals and plants of the same genus are divided according to their shared characteristics
 3. Botany – the study of plants
 4. Classification – to put things into their groups according to their characteristics
 5. Binomial nomenclature – “two names”; the system used for naming plants
- D. *Procedures/Activities*
1. This final lesson will be done a bit differently than the previous three. You will want to have taught at least one of the other three lessons in this unit prior to doing this one so that students understand the “fanny pack” idea. Instead of you making up the “fanny pack” this time, the final project for this lesson is for students to complete their own “fanny packs” and bring them in as their final project.
 2. To introduce this lesson, dump your collection of items in a pile in the middle of the floor and instruct students to sort the items out for you quickly. Tell them they will have five minutes to sort the items. Try not to give them any other information as to how to sort them, but just let them “have at it”. If they ask for more details, just tell them again that you just want them to sort the items. There will probably be mayhem.
 3. At the end of five minutes (or your patience), have students return to their seats and call on volunteers to explain how they sorted the materials. Students will probably have a difficult time doing this and a more difficult time explaining it. Discuss with students the many different ways that each of them thought of sorting these materials.
 4. Tell students that today they will be talking about another famous scientist who came up against the same problem long ago. His name was Carolus Linnaeus and he developed a sorting system that you will be learning more about in class today.
 5. Introduce students to the book *Carl Linnaeus: Father of Classification*, by Margaret J. Anderson. Read this book to the class today and discuss the life and work of Linnaeus as you read. I suggest you pre-read this book and judge your time accordingly, skipping sections that are not of high interest or relevancy to try to complete it in your allotted time period.
 6. When reading is completed, tell students that they will be doing a project to tell others about the life of Carolus Linnaeus. Hand out student copies of Appendix K, pages 1-2 – Carolus Linnaeus’s Fanny Pack Found! Project and Rubric. Go over the directions for completing this project and set a due date with your class for completion.
 7. Hand out student copies of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 204-205. Tell students that they will be reading this paper together today and doing a review based upon it, but that they should also use this paper in addition to any other resources they may find on the internet, etc. to help them complete their “fanny pack” project.
 8. Read *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 204-205 together now with students to review. Answer any questions at this time.
 9. Hand out student copies of Appendix I, pages 1-2 – Carolus Linnaeus Review. Have students work to complete this worksheet and turn it in. If class time does not allow, assign it for homework.

10. Remind students to pay attention to the details and the due date for their projects and to work hard to get things done in a timely manner so that their project is completed by the assigned due date.
- E. *Assessment/Evaluation*
1. Students completion of Appendix I, pages 1-2 – Carolus Linnaeus Review graded
 2. Student’s completion of Appendix K – Carolus Linnaeus’s Fanny Pack Found! Project to be graded according to Rubric on page 2

VI. CULMINATING ACTIVITY

- A. Each lesson has its own project that will be used as the culminating activity. Each project is designed to be a true assessment of the knowledge the student has obtained about each individual scientist. Since it is recommended that this unit be taught as four separate lessons in conjunction with the Core Knowledge topics to which they relate throughout the year, it would be difficult to have a culminating activity for the unit as a whole.

VII. HANDOUTS/WORKSHEETS

- A. Appendix A: Galileo’s “Birth Certificate” and Coloreds Only Sign (two pages)
- B. Appendix B: Galileo Project and Rubric (two pages)
- C. Appendix C: Galileo Review and Key (three pages)
- D. Appendix D: DePauw Diploma
- E. Appendix E: Quote Poster
- F. Appendix F: Julian Mini-Book Project and Rubric (two pages)
- G. Appendix G: Julian Review and Key (two pages)
- H. Appendix H: Ernest Just Review and Key (two pages)
- I. Appendix I: “Just” Another Project (two pages)
- J. Appendix J: Carolus Linnaeus Review and Key (two pages)
- K. Appendix K: Carolus Linnaeus’s Fanny Pack Found! Project and Rubric (two pages)

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Appendix A, page 1
Galileo's "Birth Certificate"

Certificate of Birth

Be it known that in 1564,
in the town of Pisa, Italy

Galileo Galilei
was born to
Vencenzio Galilei

"the Bible shows the way to Heaven,
not the way the heavens go."

- Galileo



Appendix A, page 2
Coloreds Only Sign

**Coloreds
Only!**

No whites admitted. This school is for coloreds only.

Appendix B, page 1
Galileo Project

Galileo Project c. 1564

Welcome to the world of Galileo! Your project will give you a deeper understanding of the wonderful contributions this man, Galileo, made to the field of Science, and a deeper understanding of the persecution and trials he faced because of his desire to present truth before men. Here's what you need to accomplish:

You have been given a piece of poster board. This is for your final project to be mounted on. You will not be provided with a second piece. Be sure you are ready before you begin gluing! If you "mess it up" you will have to go get your own. 😊

Steps to Follow

1. Read all of the instructions thoroughly on this page before you begin anything. Be sure you understand the directions. If you do not understand, ASK your teacher for help! 😊
2. Prepare or collect all items to be glued to your poster board. ☑
3. Do all drawing or coloring before you glue.
4. All written material should be done on separate paper and then glued to poster board.
5. All drawings or tracings should be done on separate paper and then glued to poster board.
6. Pre-arrange all items on your poster board prior to gluing them permanently. It will save you time doing it over if you mess up! 😊
7. Make sure you read the rubric on the next page carefully to see how you will be graded and do all work to the best of your ability. 👍
8. Make sure you do your OWN work and don't let your parents do it for you...they will want to!!! They love you!!! 😊
9. Make sure to use your time wisely and turn your project in on the due date. 🕒

My project is due on _____

Items that must be Present

- ❑ **Picture/Portrait/Tracing of Galileo**
- ❑ **History of his birth/education/etc**
- ❑ **History of AT LEAST three things he studied OTHER than the telescope and the heavenlies**
 - include picture of each one
 - include written description of each one
- ❑ **MAIN FOCUS – history of his work with the telescope, heavenly bodies, and conflict with the Church**
 - include information about Copernicus
 - include information about the Inquisition
 - include information about his death and pardon
 - include picture of telescope
 - include picture of universe as he believed it to be
- ❑ **Work must be neat, colorful, and YOUR OWN!**

Appendix B, page 2
Galileo Project Rubric

	4	3	2	1
Portrait of Galileo	Hand drawn or traced neatly by YOU Colored or shaded appropriately Sized well for material on poster – should be prominent visually Cut out and pasted neatly	Three of four requirements met	Two of four requirements met	Less than two requirements met
History of Birth/Education etc.	Accurate history of Galileo’s birth, education, etc. written by YOU Written neatly with no errors Completely legible Cut and pasted neatly	Three of four requirements met	Two of four requirements met	Less than two requirements met
History of THREE other things studied	Written description of THREE things Pictures of THREE things Written by YOU, neatly, with no errors All cutting and gluing neatly done	Three of four requirements met OR Only two things described	Two of four requirements met OR Less than two things described	Less than two requirements met
MAIN FOCUS telescope, his theory of the heavenlies and conflict with the Church	Written description of his work with the telescope, his theory of the heavenlies, and his conflict with the Church Information on Copernicus Information on Inquisition Picture of telescope Picture of universe Written by YOU, neatly, with no errors All cutting and pasting neatly done	Five or six requirements met	Three or four requirements met	Less than three requirements met
Total Points				
Final Grade	_____ / 16 = _____ %			

Appendix C, page 1
Galileo Review

Name _____

Date _____

Answer the following questions based upon the reading you did from *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 195-205.

1. Galileo Galilei was born in _____ in the year _____.
2. **T** **F** His family was very wealthy.
3. Galileo's father wanted him to study _____.
4. Galileo was interested in _____ and _____ instead.
5. He attended the University of _____ in 1581.
6. At the University, Galileo learned about the theories of _____, a famous Greek philosopher.
7. Galileo questioned this man's theories of _____.
8. What did Galileo find out that was different from what this man believed?

-
9. Galileo also became interested in the pendulum and used his studies to improve the ability of _____ to be more accurate.
 10. His invention of the _____ helps us move water up from under the ground.
 11. Galileo is most well known for the discoveries he made with the _____.
 12. These discoveries got Galileo in a lot of trouble with whom?

-
13. Since Galileo was a devout Catholic, why were his findings so upsetting for him? What did he firmly believe in that caused him to go against even his own church?
-
-

14. Who had written a theory about the universe before Galileo made his discoveries?
-

Appendix C, page 2
Galileo Review

15. Galileo was brought up before a group of people from the church called
- the Indecision
 - the Imperfection
 - the Inquisition
 - the Inefficient
16. The job of this group of people was to
- make people feel bad because they didn't like to go to church
 - judge people they thought were speaking out against Catholic theology
 - sentence people to death because they didn't give money to the church
 - judge people if their work for the church was not as good as it could be
17. This group of people told Galileo he
- could no longer believe in Copernican theory
 - was a heretic, which means that he publicly disagreed with the Church
 - had to go to his home near Florence and stay there under house arrest
 - all of the above
18. Galileo became _____ soon after he returned to Florence.
19. **T** **F** He continued his work with the help of supportive scientists until he died.
20. Galileo died in _____.
21. Galileo is considered the “father of the _____ approach to _____.”

Appendix C, page 3

Galileo Review-Key

Answer the following questions based upon the reading you did from *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 195-205.

1. Galileo Galilei was born in Italy in the year 1564.
2. T F His family was very wealthy.
3. Galileo's father wanted him to study medicine.
4. Galileo was interested in mathematics and philosophy instead.
5. He attended the University of Pisa in 1581.
6. At the University, Galileo learned about the theories of Aristotle, a famous Greek philosopher.
7. Galileo questioned this man's theories of motion.
8. What did Galileo find out that was different from what this man believed?

He found out that all bodies would fall at the same speed, regardless of how heavy or light they were.

9. Galileo also became interested in the pendulum and used his studies to improve the ability of clocks to be more accurate.
10. His invention of the pump helps us move water up from under the ground.
11. Galileo is most well known for the discoveries he made with the telescope.
12. These discoveries got Galileo in a lot of trouble with whom? The Roman Catholic Church
13. Since Galileo was a devout Catholic, why were his findings so upsetting for him? What did he firmly believe in that caused him to go against even his own church?

Galileo's findings were upsetting for him because he was a true scientist and he felt that it was very important to report his true findings no matter how controversial his results might be.

14. Who had written a theory about the universe before Galileo made his discoveries? Copernicus

15. Galileo was brought up before a group of people from the church called

- the Indecision
- the Imperfection
- the Inquisition
- the Inefficient

16. The job of this group of people was to

- make people feel bad because they didn't like to go to church
- judge people they thought were speaking out against Catholic theology
- sentence people to death because they didn't give money to the church
- judge people if their work for the church was not as good as it could be

17. This group of people told Galileo he

- could no longer believe in Copernican theory
- was a heretic, which means that he publicly disagreed with the Church
- had to go to his home near Florence and stay there under house arrest
- all of the above

18. Galileo became blind soon after he returned to Florence.

19. T F He continued his work with the help of supportive scientists until he died.

20. Galileo died in 1642.

21. Galileo is considered the "father of the experimental approach to science."

Appendix D
DePauw Diploma

DePauw University

This certifies that

Percy Lavon Julian

has completed all the requirements for the degree of

Bachelor of Science

and is hereby awarded this diploma on

the 21st day of May in the year of our Lord, 1920.

President of DePauw University

Dean of Students of DePauw

Appendix E
Quote Poster

*“I would
forever fight
to keep hope
alive.”*

- Percy Lavon Julian

Julian Project

Welcome to the Julian Project! Your project will give you a deeper understanding of the wonderful contributions the man, Percy Lavon Julian, made to the field of Science, and a deeper understanding of the racial prejudice and other trials he faced because of his race and economic status. Here's what you need to accomplish:

You have been given a mini-booklet. This is for your final project to be completed in. You will not be provided with another mini-booklet. Be sure you do a rough draft and figure out what will go on each page before you begin putting together your final project. If you “mess it up” you will have to make a new booklet on your own. ☺

Steps to Follow

1. Read all of the instructions thoroughly on this page before you begin anything. Be sure you understand the directions. If you do not understand, ASK your teacher for help! ☺
2. Think about and write all requirements to be added to your mini-booklet on scrap paper first. ☑
3. You might want to do all drawings on separate paper and cut them out and glue them into your booklet. Then if you make a mistake, you can do it over without ruining your book.
4. All written material should be done in your own handwriting and you should use lines to make sure your writing is straight and neat.
5. All pictures should be colored and all writing should be in cursive.
6. Make sure you read the rubric on the next page carefully to see how you will be graded and do all work to the best of your ability. ☺
7. Make sure you do your OWN work and don't let your parents do it for you...they will want to!!! They love you!!! ☺
8. Make sure to use your time wisely and turn your project in on the due date. ☺

My project is due on _____

Items that must be Present

- Cover – Percy Lavon Julian
 - Name in fancy print at top of cover
 - Drawing/Tracing of picture of Julian colored and cut out and pasted on
 - Your full name in bottom right-hand corner of cover
- Page 1 – History of birth, schooling, home in Montgomery, Alabama
- Page 2 – Math test – 80% showing dad – paragraph about parents wanting him to do well
- Page 3 – College in Indiana – paragraph about going to DePauw University – graduated 1920
- Page 4 – Fisk University, teacher Harvard – Master's degree W. Virginia State/Howard Univ. – teacher at black schools
- Page 5 – Vienna, Austria – PhD Paragraph about this
- Page 6 – Chemical studies – Calabar bean – Physostigmine – glaucoma – eye disease
- Page 7 – Glidden – soybeans – Aero-foam, hormones for birth control pills, medical problems, saving premature babies, cortisone for arthritis for less \$\$\$
- Page 8 – Awards, famous quote, death in 1975

Every page should have a picture at the top that you have drawn that is related to the information that is on that page. At the bottom of every page, you should write a short paragraph about that particular topic. Make sure you write at least three sentences for each page. Write neatly and plan ahead first.

Appendix F, page 2
Julian Mini Book Project Rubric

	4	3	2	1
<i>Cover of Booklet</i>	Title is in proper place and done in decorative writing with marker or colored pencil. Picture of Julian is hand drawn or traced neatly by YOU and colored or shaded appropriately. Sized well for material on cover – should be prominent visually. Full name in bottom right-hand corner.	Three of four requirements met	Two of four requirements met	Less than two requirements met
<i>Pages of Booklet Written Info.</i>	Accurate written information is on each page as designated on assignment sheet. (eight pages) Written neatly with no errors. Written in cursive. Completely legible.	Five to seven of the page requirements were met properly.	Three to four of the page requirements were met properly.	Less than three page requirements met properly.
<i>Pages of Booklet Illustrations</i>	Every page (8) has a picture drawn. Picture takes up at least ½ of the page (top portion). Picture relates well to the writing at the bottom. Picture shows effort and is colored very well.	Three of four requirements met OR pictures only on 5-7 pages	Two of four requirements met OR pictures only on 2-4 pages	Less than two requirements met OR pictures on less than 2 pages
<i>General Appearance of book at Due Date</i>	Booklet has been done well. It looks neat and tidy. It is apparent that you planned ahead and knew what you were doing before you start. No obvious erasures or mistakes in pictures or written material.	Three of the four requirements met	Two of the four requirements met	Less than two requirements met
<i>Total Points</i>				
<i>Final Grade</i>	_____ / 16 = _____ %			

Appendix G, page 1
Julian Review

Name _____

Date _____

Using your copy of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 198-200, answer the following questions.

1. Percy Lavon Julian was born in _____, _____ in 1899.
2. He only received an education up to the _____ grade before he went to college.
3. He attended _____ University in Indiana.
4. He graduated at the top of his class in _____.
5. Percy got his first job as a _____ at _____ University.
6. He taught _____.
7. Percy went to the famous _____ University, in Cambridge, Massachusetts and received his _____ degree.
8. He wanted to do research, but had to go to _____, Austria to do it because colleges in the United States would not hire _____ to teach for them yet.
9. He received his _____ from the University of _____ in 1931 for his research on chemicals found in _____.
10. Dr. Julian synthesized a chemical called _____ with was used to treat _____, an eye disease that caused blindness.
11. He went to work for _____, a company that makes paint and varnishes. He worked for them for _____ years.
12. Here he worked with _____ and developed a process to get the oil out of them.
13. He developed a product called _____ which was used to put out oil and gas fires.
14. There was an accident at the Glidden plant that helped Dr. Julian discover that he could synthesize _____ from the oil and this was used to make things like birth control pills and to help premature babies survive.

Appendix G, page 2
Julian Review

15. He also developed a much cheaper way to produce _____, a drug used to treat _____, a disease that caused severe pain and swelling.
16. Dr. Julian’s famous quote, “I would _____ fight to keep _____” meant that:

_____.
17. Dr. Julian died in _____.
18. Something I learned from studying the life of Percy Lavon Julian was

_____.

Answer Key

1. Montgomery, Alabama
2. eighth
3. DePauw
4. 1920
5. teacher; Fisk
6. chemistry
7. Harvard; Master’s
8. Vienna; blacks
9. Ph.D.; Vienna; plants
10. physostigmine; glaucoma
11. Glidden; 17
12. soybeans
13. Aero-foam
14. hormones
15. cortisone; rheumatoid arthritis
16. forever; hope; Dr. Julian was very persistent and would keep working to help people both with his work in chemistry and in his fight for equality for blacks everywhere.
17. 1975
18. answers will vary

Appendix H, page 1
Ernest Just Review

Name _____

Date _____

Using your copy of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 201-203, answer the following questions carefully.

1. Ernest Everett Just was born in the year _____ in _____, South Carolina.
2. His father died when he was _____.
3. His mother, Mary, started the town of _____ which showed that she had a very strong _____ ethic.
4. She insisted that her son get a good _____ and sent him away to _____, in Massachusetts, to go to high school.
5. He was so smart he finished school in _____ years.
6. In 1903 he went to _____ College, in New Hampshire.
7. He studied _____ and _____, with a specialty in _____ or the study of cells.
8. After graduation, he went to teach _____ at _____ University.
9. He spent his summers at _____, Massachusetts at the _____ Biological Laboratory performing experiments.
10. In 1916, Just received his _____ from the University of _____ for his work in the field of _____, focusing on the process of _____ fertilization.
11. By studying marine mammals and their eggs, he gave other scientists information about the structure of the _____.
12. Just went to _____ to study more, because the white medical and scientific community wouldn't pay any attention to him in the United States. He studied at the _____ Zoological Station in _____ in 1929.

Appendix H, page 2
Ernest Just Review

13. Ernest Just was the first American to teach at the _____ Institute in Germany, which was one of the world's greatest _____ laboratories at that time.
14. One of the books he published in 1939, while he was in France, explained the importance of the outer layer of the _____, known as the outer _____. He began to call this the _____ which is the name we use for it today.
15. Just wanted to stay in _____, but could not because of World War II. He was captured by _____ and was kept as a _____ of _____ for a short time.
16. His work with the _____ has allowed medical researchers to continue their study of _____ cells, such as with diseases like sickle-cell anemia, _____, and others.
17. Ironically, Ernest Just died of _____ in 1941, the disease that his work was providing information to researchers about.
18. One character trait that Ernest Just exhibited in his lifetime was _____. He showed this character trait by _____.

Answer Key

1. 1883; Charleston
2. four
3. Maryville; work
4. education; Kimball Hall
5. three
6. Dartmouth
7. biology; history; cytology
8. biology; Howard
9. Wood's Hole; Marine
10. Ph. D.; Chicago; embryology; egg
11. cell
12. Europe; Naples; Italy
13. Kaiser Wilhelm; research
14. cell; cytoplasm; ectoplasm
15. France; Germany; prisoner; war
16. cell; diseased; cancer
17. cancer
18. perseverance, diligence, courage, etc. – answers will vary

“ Just ” Another Project

Welcome to “Just ” Another Project! Your project will give you a deeper understanding of the wonderful contributions the man, Ernest Everett Just, made to the field of Science, and a deeper understanding of the racial prejudice and other trials he faced because of his race and economic status. Here’s what you need to accomplish:

You have been given eight index cards and eight pieces of construction paper. These are for your final project to be completed on. You will not be provided with more. Be sure you do a rough draft and figure out what will go on each card before you begin putting together your final project. If you “mess it up” you will have to get new cards and paper for yourself. ☺

Steps to Follow

1. Read all of the instructions thoroughly on this page before you begin anything. Be sure you understand the directions. If you do not understand, ASK your teacher for help! ☺
2. Think about and write all requirements to be added to your index cards on scrap paper first. ☑
3. All written material should be done in your own handwriting and it should be very neat.
4. All writing should be in cursive.
5. Each card should be glued neatly to the right colored construction paper rectangle after you are finished writing on it.
6. Use a single hole puncher to put two holes at the top and bottom of cards #1-7. Put two holes only on the top of card #8.
5. Make sure you read the rubric on the next page carefully to see how you will be graded and do all work to the best of your ability. ♡
6. Make sure you do your OWN work and don’t let your parents do it for you...they will want to!!! They love you!!! ☺
7. Make sure to use your time wisely and turn your project in on the due date. ⌚

My project is due on _____

Items to be Included

- Card #1 - Title Card - Red
 - Ernest Everett Just
 - Born ?
 - Died ?
- Card #2 - Birth, Early Education, Etc. - Orange
- Card #3 - College - Yellow
- Card #4 - First job(s) - Green
- Card #5 - PhD, research - Blue
- Card #6 - Europe, Kaiser Wilhelm Inst., Books, WWII, ectoplasm - Purple
- Card #7 - Late career - Red
- Card #8 - Later years, death, character attribute displayed in his life, your full name on the bottom line of card - Orange

Every card should have the above information on it taken from your copy of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 201-203. Write neatly and try to fill each card. You may only use one card for each section. Glue each card to the appropriately colored construction paper piece. Punch holes in cards on the top and bottom and tie them together with pieces of yarn to make a “Hanging Report”. Cards should hang in number order from top to bottom. Put yarn at top to use to hang report.

“Just” Another Project Rubric

	4	3	2	1
Title Card	Title is in proper place and done in decorative writing Dates of birth and death incl. Sized well for material on card	Three of four requirements met	Two of four requirements met	Less than two requirements met
Information Cards #2-8	Accurate written information is on each card as designated (seven cards). Written neatly with no errors. Written in cursive. Completely legible.	Five to six of the card requirements were met properly.	Three to four of the card requirements were met properly.	Less than three of the card requirements were met properly.
Neatness and Display Quality	Every card (8) has been glued on the appropriately colored construction paper. Holes were punched carefully and evenly on all cards. Yarn ties were done well to hold project together Effort was shown to display project neatly.	Three of four requirements met	Two of four requirements met	Less than two requirements met
General Appearance of project at Due Date	Report has been done well and turned in on time. It looks neat and tidy. It is apparent that you planned ahead and knew what you were doing before you started. No obvious erasures or mistakes in written material.	Three of the four requirements met	Two of the four requirements met	Less than two requirements met
Total Points				
Final Grade _____ /16= _____ %				

Appendix J, page 1
Carolus Linnaeus Review

Name _____

Date _____

Using your copy of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 204-205, complete the following questions.

1. Carolus Linnaeus developed
 - a system for naming parts of the body
 - a system for naming things we don't have names for yet
 - a system for naming the natural world
 - a system for naming newborn babies

2. He did this because
 - doctors had trouble communicating about patients
 - scientists had trouble communicating about plants
 - Latin names were hard to read
 - No one thought it was important to name things

3. Carolus Linnaeus was born in 1707 in _____.

4. His father was a _____. His parents wanted him to be a _____.

5. He chose to study _____ and began his studies in _____ at the University of _____.

6. He focused his study on _____, or the study of plants. Many medical students did this because they used plants to make _____.

7. In 1732, he went to _____ to study plant life.

8. He developed a system to classify plants according to their _____ parts.

9. His technique used _____ names for each plant and is called _____.
_____. This system for naming plants is still used today.

10. He also introduced a system for naming _____.

Carolus Linnaeus Review

11. Linnaeus's system formed the basis for the way scientists, doctors, and students around the world refer to the _____ world. His system brought _____ to the natural sciences. Without his system, the _____ of natural science would not exist as we know it today.
12. Carolus Linnaeus showed the character quality of _____ in his work.

Answer Key

1. c
2. b
3. Sweden
4. clergyman; priest
5. medicine; 1727; Lund
6. botany; medicines
7. Lapland
8. reproductive
9. two; binomial nomenclature
10. animals
11. natural; consistency; language
12. diligence, perseverance, etc. – answers will vary

Carolus Linnaeus's Fanny Pack Found!

Project due date _____

Welcome to your own Fanny Pack Project! Your project will give you a deeper understanding of the wonderful contributions the man, Carolus Linnaeus, made to the field of Science, and a deeper understanding of the difficulties involved in doing something as vast as what he was able to contribute to the Scientific world. Here's what you need to accomplish:

You have been given, or asked to provide, a fanny pack for use for this project. Your final project will be to fill this fanny pack with items to describe the life of Carolus Linnaeus as you give an oral presentation to the class about his life.

You have also been provided with index cards on which to write your presentation information. If you need more cards, they can be provided for you.

Read this entire instruction sheet before you begin your project so that you know what is expected from you. You will be responsible to find all of the items you need on your own. Everyone will have different ideas of ways to illustrate the life of this man. There will not be a required number of items to put in your fanny pack, but you must make sure that you have one item for each main point that you will cover about his life. The more creative you can be the better. You may have to make some items as well by making drawings, etc. Again, be creative.

Using your copy of *Text Resources: Grade 5*, by Core Knowledge Foundation, pp. 204-205, "write your report" about Linnaeus. You should write your information on index cards so that you can read them to the class. Use one card for each item that you will show and describe. Number your cards so that you don't get them all mixed up. Think about what you could collect to show us for each main point and then collect your items and put them in your fanny pack.

Practice giving your presentation several times to someone at home until you are comfortable with getting the items out and describing them to others. Be sure you look over the grading rubric for this presentation carefully, because you will be graded not only on the content you share, but on your presentation ability and your manners while listening to other presentations. Practice, practice, practice and use your time wisely so that you are well prepared and ready to go on the due date.

Have fun with this and remember, it is YOUR project, not Mom and Dad's. They will want to do it for you because they love you. Tell them you would like to be creative on your own this time! They can surely help you with ideas, but the written work needs to be your own.

Carolus Linnaeus's Fanny Pack Found! Rubric

	4	3	2	1
Message	<p>Your information was clear. I completely understood it. It had a logical flow of ideas. You clearly did your research and shared great information on this person's life. Note cards were used. An adequate number of items were presented from your fanny pack and they were relevant to your report.</p> <p>1 2 3 4 5 6</p>	<p>Four to five of the six requirements met</p>	<p>Two to three of the six requirements met</p>	<p>Less than two of the six requirements met</p>
Delivery	<p>Your delivery was awesome. You stood straight up, made eye contact with the class, were loud enough to be heard, and were appropriately enthusiastic. It was obvious that you were well-prepared and practiced. Way to go!</p> <p>1 2 3 4 5 6</p>	<p>Your delivery was good, but one to two of the elements asked for were missing.</p>	<p>Your delivery lacked three of the elements asked for.</p>	<p>Your delivery lacked four or more of the elements asked for.</p>
Classroom Behavior	<p>Super! You behaved in a considerate manner while others were delivering their reports!</p>	<p>You mostly behaved in a considerate manner while others were delivering their reports!</p>	<p>The teacher reprimanded you more than once while other students were presenting their reports. You need to think about your behavior and make adjustments in the future.</p> <p>1</p>	<p>The teacher reprimanded you more than twice while other students were presenting their reports. You need to think about your behavior and make adjustments in the future.</p> <p>1 2</p>
Due Date	<p>Report was prepared and ready to present on time.</p>	<p>Report was prepared one day late.</p>	<p>Report was prepared two days late.</p>	<p>Report was more than two days late.</p>
Total Points				
<p>Final Grade</p> <p style="margin-left: 100px;">/16= %</p>				