

Treats and Treasures

From the Botanical World

Pre and Post Field Study Packet



Field Study Orientation

From the time that humans first walked the earth, plants have been vital to their very survival. Plants produce the oxygen that we breathe and are directly or indirectly responsible for the food that we eat. Many of our medicines, clothing, housing materials, and fuels were once plants!

As a society we have slowly become separated from the sources of our food and other items that we use in our everyday lives. When asked whether they have eaten any plants lately, many children will reply "no". This is true even though they have consumed a breakfast of cereal, oatmeal, bagels, or toast.

In this field trip to the State Botanical Garden, children will discover the importance of plants in their daily lives. They will learn that the foods, medicines, and other products that they use every day do not just come from local stores, but have their origins in plants from around the world. Lastly, they will team up with classmates to become plant explorers who, like Bartram and Columbus, might spend their lives in search of undiscovered plant species.

A Field Trip for Grades 3-5
The State Botanical Garden of Georgia

Revised 11/2007

Treats and Treasures From the Botanical World

Pre and Post Field Study Packet

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Treats and Treasures from the Botanical World
Pre and Post Field Study Packet



**2450 South Milledge Avenue
Athens, Georgia 30605-1624**

Dear Teacher,

Please find the enclosed activity sheets for suggested pre and post field study activities for your *Treats and Treasures of the Botanical World* field study at the State Botanical Garden of Georgia. The pre field study activities will help prepare your students for your field trip, and the post field study activities will extend the students' knowledge as they apply what they learned at the Garden to their own school site. Correlations to Georgia Performance Standards for grades 2-7 are also included. This field study fits the 4th grade GPS most closely.

Before your field trip, your students will have the opportunity to go on a *Plant Explorer's Mission* and learn about famous plant explorers. They will learn that many of the products we use every day come from plants!

Students may also explore the origins of some of their favorite foods. They will discover that although we usually buy our food at the grocery store, many of the foods that we enjoy come from plants all over the world.

We look forward to your visit to the State Botanical Garden of Georgia.

Sincerely,

Education Staff
State Botanical Garden of Georgia
2450 South Milledge Avenue
Athens, Georgia 30605
706-542-6156
sbgeduc@uga.edu

Treats and Treasures Field Study
4th Grade GPS Correlations

U.S. History		Pre Field Study				Field Study				Post Field Study			
		Top Secret Mission	Plant Work Sheet	Plant Explorers' Cards	Origins of Favorite Foods	Candy Bar Dissection	The Plant is Right	Plant Explorers' Hunt	GA Heritage Hunt	Plant Explorer's Mission Data Sheet	Design Your Own Hunt	Create Your Own Game Show	Research Other Explorers
SS4H1. The student will describe how early Native American cultures developed in North America.	Describe how the American Indians used their environment to obtain food, clothing, and shelter												
SS4H2. The student will describe European exploration in North America	Describe the reasons for, obstacles to, and accomplishments of the Spanish, French, and English explorations												
SS4H6. The student will explain westward expansion of America between 1801 and 1861.	Describe territorial expansion with emphasis on the Lewis and Clark expedition.												
SS4G2. The student will describe how physical systems affect human systems	a. describe how the early explorers (SS4H2.a) adapted, or failed to adapt to the various physical environments in which they traveled.												

Treats and Treasures Field Study
4th Grade GPS Correlations

Life Science	Pre Field Study				Field Study				Post Field Study			
	Top Secret Mission	Plant Work Sheet	Plant Explorers' Cards	Origins of Favorite Foods	Candy Bar Dissection	The Plant is Right	Plant Explorers' Hunt	GA Heritage Hunt	Plant Explorer's Mission Data Sheet	Design Your Own Hunt	Create Your Own Game Show	Research Other Explorers
S4L1. Students will describe roles of organisms and the flow of energy within an ecosystem.				✓	✓						✓	
S4L2. Students will identify factors that affect survival or extinction of organisms such as adaptation, variation of behaviors and external features (camouflage and protection						✓	✓		✓			

Treats and Treasures Field Study
2nd – 7th Grade GPS Correlations

Science Habits of Mind	Pre Field Study				Field Study				Post Field Study			
	Top Secret Mission	Plant Work Sheet	Plant Explorers' Cards	Origins of Favorite Foods	Candy Bar Dissection	The Plant is Right	Plant Explorers' Hunt	GA Heritage Hunt	Plant Explorer's Mission Data Sheet	Design Your Own Hunt	Create Your Own Game Show	Research Other Explorers
S2CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own effort to understand how the world works.	a. Raise questions about the world around them and be willing to seek answers to some of the questions by making careful observations and measurements and trying to figure things out	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
S2CS4. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters	b. Use a model - such as a toy or picture - to describe a feature of a primary thing.									✓		
S2CS5. Students will communicate scientific ideas and activities clearly.	b. Draw pictures (grade level appropriate) that correctly portray features of the thing being described.									✓		

Treats and Treasures Field Study
2nd – 7th Grade GPS Correlations

The Nature of Science		Pre Field Study				Field Study				Post Field Study			
		Top Secret Mission	Plant Work Sheet	Plant Explorers' Cards	Origins of Favorite Foods	Candy Bar Dissection	The Plant is Right	Plant Explorers' Hunt	GA Heritage Hunt	Plant Explorer's Mission Data Sheet	Design Your Own Hunt	Create Your Own Game Show	Research Other Explorers
S2CS7. Students will understand important features of the process of scientific inquiry	a. Scientists use a common language with precise definitions of terms to make it easier to communicate their observations to each other.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	b. In doing science, it is often helpful to work as a team. All team members should reach their own individual conclusions and share their understandings with other members of the team in order to develop a consensus.						✓				✓	✓	
	c. Much can be learned about plants and animals by observing them closely. Care must be taken to know the needs of living things and how to provide for them							✓					

Plant Explorer's Mission

Attention: All Plant Explorer Recruits

From: President of FLORAH (Find Lots of Really Amazing Horticulture)

RE: Your field study to the State Botanical Gardens

TOP SECRET

Hello potential field agents 008 - 0032. You have been selected by a group of secret panelists to become a Plant Explorer for World Wide Amazing Plants (WWAP)! It is quite an honor to have the title of Plant Explorer, and I hope that you are up to the task. Just think, your name might be included next to other famous plant explorers such as William and John Bartram, who discovered over 350 amazing plants in North America and Georgia in the late 1700's! What? Did you say that you don't know about William Bartram and the other plant explorers? **Please study the enclosed Plant Explorer Trading Cards before continuing!**

Your mission, if you should choose to accept it, is outlined below:

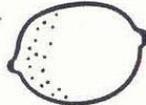
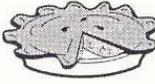
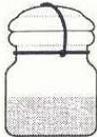
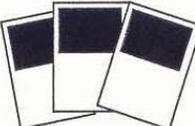
- First, as a plant explorer you need to recognize all of the amazing plants that you use everyday. Test your skills by completing the training worksheet.
- Second, read the amazing lives of some plant explorers on the attached Plant Explorer cards and complete the matching activity.
- After completing this worksheet report to Headquarters (The State Botanical Garden of Georgia) with your classmates. Here you will go through a rigorous training session where you will have your first field experience as a plant explorer.

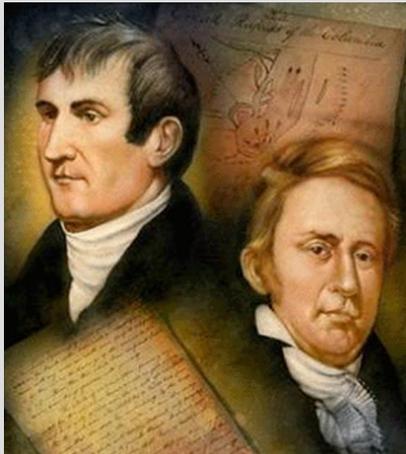
Good luck, potential field agents. I will see you at Headquarters!

This Top Secret message is printed on a substance from an Amazing Plant

Plant Explorers' Training Worksheet

**Test your knowledge of the amazing plants we use everyday.
 Circle each item which is a plant, comes from plants, is made
 from plants, or which could not exist without plants.**

			
PLASTIC BAG	SHIRT	CHAIR	CLEAN AIR
			
ROCK	HOUSE	GASOLINE	OXYGEN
			
LEMON	RUBBER BALL	TOPSOIL	PIG
			
PIE	DOLL	MEDICINES	PEANUT BUTTER
			
GLASS JAR	AIRPLANE	TIGER	SHOE
			
MILK	GOLD RING	BASEBALL CARDS	WHALE
			
FIRE IN FIREPLACE	ICE	PENNY	COMPUTER



**Meriwether Lewis
(1774-1809)**

**William Clark
(1770-1838)**

Bitterroot (*Lewisia rediviva*), described by Lewis and Clark, is the state flower of Montana.

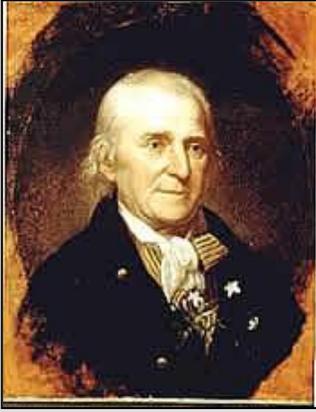
Thomas Jefferson dispatched Lewis and Clark to find a water route across North America and describe the landscape, people, flora, and fauna of the uncharted West. The native people taught them about edible, medicinal, and other useful plants. Lewis, the naturalist of the group, collected over 200 species of plants. Today his herbarium is in the collection of the Academy of Natural Sciences in Philadelphia.



**Jacques Cartier
(1491-1557)**

Branch of the
arborvitae tree

Cartier was a French explorer who was sent to find a Northwest Passage to Asia. He discovered the St. Lawrence River in North America and claimed Canada for France. On one of his journeys, some of his crew became sick with scurvy. Scurvy, a deficiency in Vitamin C, was common amongst sailors who did not have supplies of fresh fruit and vegetables. Native people of the area taught him to boil the needles of the arborvitae tree (Eastern White Cedar) to make a tea. This tea cured the crew of scurvy. Jacques Cartier introduced this evergreen tree to Europe.



William Bartram (1739-1822)



Franklinia alatamaha
collected by William and John Bartram

William Bartram and his father John Bartram were both famous botanists. William was the first native born naturalist/illustrator in the colonies. William Bartram traveled through or near the area which now comprises the State Botanical Garden of Georgia. His book, *Travels through North and South Carolina, Georgia, East and West Florida*, is considered the best account of the flora, natural history, and native peoples of Colonial America. William Bartram described 358 species of plants and animals in his book, 158 of which were new to science at the time. He found many important plants, including *Franklinia* (named after Ben Franklin) and the Georgia fever tree (feverbark).



John Tradescant the Younger (1608-1662)



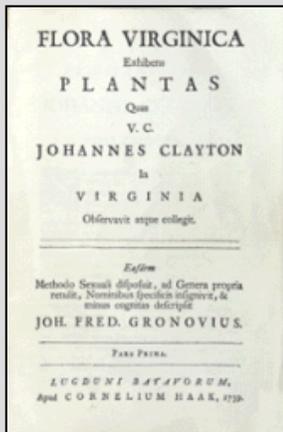
Tradescantia also called
spiderwort

John Tradescant journeyed to the colony of Virginia three times in 1637, 1642, and 1654. He collected numerous plants, animals, and human artifacts. He added these specimens to "Tradescant's Ark" the first public museum in England. Together with his father, John Tradescant the Elder, he founded this museum in 1629. Later the collection was used to start what is today the Ashmolean Museum in Oxford. He introduced the tulip poplar, the pitcher plant, and the yucca plant to England. His work is honored with the botanical name of Virginia spiderwort (*Tradescantia virginiana*), common throughout much of Georgia and the Southeast.



Christopher Columbus (1451-1506)

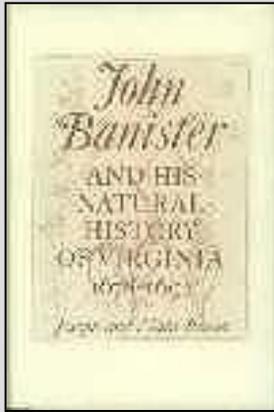
Christopher Columbus was an Italian explorer who sailed for Spain. He made four trips to the New World between 1492 and 1504. He was the first European to explore the Caribbean (also called the West Indies), Venezuela, Mexico, and Central America. On his voyages in the West Indies, he saw such food producing plants as pineapples, sweet potatoes, and corn. These plants were unknown to Spain and many parts of the world.



John Clayton (1694-1773)

Clayton's specimens became the basis for this treatise on the plants of Virginia. There are no known pictures of John Clayton.

Clayton was born in England and emigrated to Virginia to join his father in 1715. He became interested in botany through his friend Mark Catesby, the famous naturalist and illustrator. In 1716, he joined Catesby on the Spotswood Expedition to the Blue Ridge Mountains. After Catesby's return to England, Clayton started collecting and sending specimens to him. These specimens became the basis for *Flora Virginica* (published 1739-43) written by J.F. Gronovius. Many of Clayton's specimens were named and described by Linnaeus. Today his specimens are housed in The John Clayton Herbarium at the Natural History Museum, London.



John Banister (1650-1692)

Virginia Bluebells
First sent to Europe by John Banister

Banister was the first English Botanist of the New World. He studied natural science at Oxford and collected plants for the Oxford Physic Garden. In 1678, he left England for Virginia at the request of the Bishop of London. He settled near Jamestown and devoted himself to botanical pursuits. He wrote a natural history of Virginia and sent hundreds of specimens to England. He was accidentally shot and killed while on a botanical expedition to the Roanoke River in 1692. He was the first European botanist to collect American Ginseng.

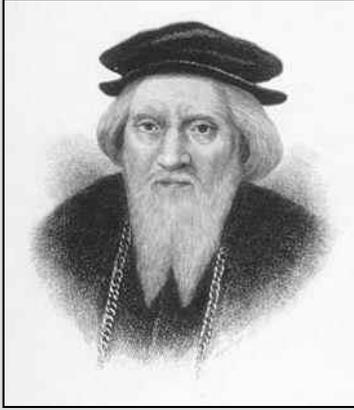


Illustrations by Catesby



Mark Catesby (1682-1749)

Mark Catesby came to North America in 1712 and 1722 and traveled widely in southeast North America and the Bahamas. His book, *Natural History of Carolina, Florida, and the Bahama Islands*, (published in London) became a botanical landmark of the period. His engraved and colored botanical illustrations are popular even today. He was the first European to describe the Northern Mockingbird.



**John Cabot
(circa 1450-1499)**

Cabot was born in Italy but moved to England in 1495. At the request of King Henry VII of England, Cabot sailed to Canada in 1497. Cabot landed near Labrador, Newfoundland, or Cape Breton Island (the exact spot is uncertain) on June 24, 1497 claiming the land for England. The mission's purpose was to search for a Northwest Passage across North America to Asia. Cabot was unsuccessful, although he thought that he had reached northeastern Asia. Cabot undertook a larger expedition in 1498. On this trip, Cabot may have reached America, but it is uncertain. Cabot's expeditions were the first of Britain's claims to Canada.



**James Edward Oglethorpe
(1696-1785)**

Oglethorpe was an English General and philanthropist as well as founder of the American colony of Georgia. In 1722, he was elected to the House of Commons, where he held a seat for 32 years. While chairman of a parliamentary committee investigating penal conditions, he proposed to establish an asylum for debtors located in a new colony. This colony would provide a needed buffer between South Carolina and Spanish Florida. Oglethorpe and 19 associates were granted a charter in June, 1732, making them trustees of the colony of Georgia for the next 21 years. On February 12, 1733, he founded the city of Savannah.



Plant Explorer Matching Game

Match the famous explorer with his great feat!

Explorer

Great Feat



Christopher Columbus

• *Discovered Newfoundland*

William Bartram

• *"Spider Wort" was named after him*

Jacques Cartier

• *Thomas Jefferson sent them "out west"*

John Tradescant

• *French explorer discovered a new-world botanical cure for scurvy*

Mark Catesby

• *He even explored the land that the State Botanical Garden of Georgia was built on in Athens*

John Cabot

• *Wrote about colonial Virginia botany*

Lewis & Clark

• *Founder of the colony of Georgia*

James Oglethorpe

• *Sent Virginia "Blue Bells" to England*

John Banister

• *Great Botanical Illustrator*

John Clayton

• *Great Explorer who discovered S. America, Jamaica & the Bahamas*



Explorer



Great Feat

Plant Explorer Matching Game Answer Key

Christopher Columbus	→	• <i>Great Explorer who discovered S. America, Jamaica & the Bahamas</i>
William Bartram	→	• <i>He even explored the land that the State Botanical Garden of Georgia was built on in Athens</i>
Jacques Cartier	→	• <i>French explorer discovered a new-world botanical cure for scurvy</i>
John Tradescant	→	• <i>"Spider Wort" was named after him</i>
Mark Catesby	→	• <i>Great Botanical Illustrator</i>
John Cabot	→	• <i>Discovered Newfoundland</i>
Lewis & Clark	→	• <i>Thomas Jefferson sent them "out west"</i>
James Oglethorpe	→	• <i>Founder of the colony of Georgia</i>
John Banister	→	• <i>Sent Virginia "Blue Bells" to England</i>
John Clayton	→	• <i>Wrote about colonial Virginia botany</i>

Where Do Your Favorite Foods Come From?

What are your favorite foods? Think about your favorite foods to eat at breakfast, lunch, and dinner. Write them on the lines below.

We usually buy our food at the grocery store, but what part of the world do you think your favorite foods originally came from? For example, if you have a fruit as one of your favorite foods, where do you think it is grown? Fill in the chart below. It's alright to take a guess if you are not sure!

Favorite Food	Country of Origin (guess)
1.	
2.	
3.	
4.	
5.	

Let's check your answers! Research your favorite food by looking on the internet, encyclopedia, or using other resources from your classroom or school library. Were your guesses correct? Were you surprised to discover where your favorite foods come from?

Favorite Food	Country of Origin (after research)
1.	
2.	
3.	
4.	
5.	

Extension: Color the countries that your favorite foods come from on the map. Our favorite foods come from all over the world!

Treats and Treasures From the Botanical World

Post Field Study Activities

The following activity sheets may be used to strengthen student understanding after their field trip to the State Botanical Garden. The activities may be simplified or advanced to better suit your course of study, your time frame, and the needs of your students.

Have your students break into groups of two or three. Assign each group to a plant from the *Plant Explorer's Hunt* to research its specific uses. Read the *Plant Explorer's Mission* to the class. Have the students research their plants on the internet or in the library. After researching, each group presents their information to the class.

As students present, the other students can record all of the information on their *Mission Data Sheets*. This process is similar to the process that botanists would likely go through (observation, research, presentation). Some answers are provided on the *Plant Explorer's Hunt Answer Sheet*.

World Wide Amazing Plants

Your P.L.A.N.T.S. travel machine takes you to the following eleven locations that have been marked for you. Study information on each plant. Determine its country of origin and specific uses. (The first two have been underlined to help you.) Record this data on your mission data sheet.

1. Lamb's Ear, *Stachys byzantina*, SW Asia, N. Turkey, S. Caucasus, N. Iran; **Use:** The leaves were used as bandages during the Civil War.

2. Barberry, *Berberis thunbergii*, Japan; **Use:** The bark from its roots can be made into a tea that is antiseptic (kills germs), is used to rid the body of intestinal parasites, and also reduces fever.

3. Blueberry, *Vaccinium corymbosum*, eastern United States; **Use:** These wild berries were an important food in the Native American diet. The fruit was cultivated in the spring and late fall, sometimes the berries were dried over a fire or by the sun to use in the winter months. Today hybrids are cultivated for pies, syrups, and it is used commercially.

4. Yaupon Holly, *Ilex vomitoria*, southeast United States; **Use:** A tea made from the leaves (and other plants) was drunk ceremoniously by Native Americans in the southwest to cleanse the body and soul. Natives were said to have vomited after drinking the tea made from it's leaves, hence, its species name 'vomitoria'.

5. Centipede Grass, *Eremochloa ophiuroids*, China; **Use:** An American plant explorer went to China and was never heard from again but his trunk showed up at USDA in Beltsville, Maryland. In it was grass. It was planted at Beltsville but the climate was too cold. A sample was sent to Tifton, Georgia as a potential forage grass. The grass grew too slow for forage. Dr. Burton at Tifton started promoting the grass as a lawn grass. It caught on and is now widely used throughout Georgia and beyond.

6. Adina, *Adina rubella*, south China; **Use:** Timber. This plant yields a durable wood.

7. Bottlebrush Buckeye, *Aesculus parviflora*, southeast U.S.; **Use:** Native peoples supposedly crushed the seeds of the buckeye and sprinkled the powder in small pools of water to kill fish. They could then easily collect and eat the fish. According to local superstition, it brings good luck to carry a buckeye seed in your pocket.

8. Pecan, *Carya illinoensis*, eastern North America; **Use:** The wood is used for flooring, fuel, and furniture, and the nuts are delicious to eat. It is widely planted in the South for its fruit and ornamental appeal. The nuts provided much needed fatty acid to Native Americans.

9. Spanish Bayonet, *Yucca aloifolia*, southeast United States; **Use:** *Yucca filamentosa*, known as bear-grass, supplied edible flowers and leaves to the Native Americans of the South. The fibers in the leaves could also be spun into cord and rope.

10. Garden Asparagus, *Asparagus officinalis*, Europe; Use: Young asparagus shoots are eaten throughout the world. Native Americans used asparagus to cure bladder problems. Asparagus also helps cure constipation and hypertension.

11. Sphagnum Moss, *Sphagnum sp.*, widespread distribution; Use: Sphagnum Moss has played a major role in healing wounds throughout history up until World War II. It is able to absorb sixteen times its own weight in liquids (twice as much as cotton). Many people still use Sphagnum moss as diaper material.

12. Atlantic White Cedar, *Chamaecyparis thyoides*, eastern United States; Use: This is a very important timber tree. Because this tree is used to living in wet areas, it has adapted rot-resistant wood. It was widely used for telephone poles. Over-use and loss of habitat have caused the endangerment of this tree in Georgia

Plant Explorers' Mission Data Sheet

Name(s) _____ Date _____

Below is a list of World Wide Amazing Plants. Make sure to record all of the information presented, especially the specific use of each plant.

<i>Name of Plant</i>	<i>Country of Origin</i>	<i>Specific Use</i>
1. Lamb's Ear		
2. Barberry		
3. Blueberry		
4. Yaupon Holly		
5. Centipede Grass		
6. Adina		
7. Bottlebrush Buckeye		
8. Pecan		
9. Spanish Bayonet		
10. Garden Asparagus		
11. Sphagnum Moss		
12. Atlantic White Cedar		

*Congratulations! You have completed your International Plant Explorer's Mission!
You are now a Lifetime Plant Explorer. Keep up the good work!*

Design Your Own Plant Explorers' Hunt!

1. In this activity, you will design a Plant Explorer's Hunt for your school site in a format that is similar to the Hunt that you participated in at the State Botanical Garden. Divide into teams and search your school campus for different plants that are growing there. Take a field guide book with you to identify the plants. Write down the plants that you find and the location where they are growing (ex: by the front door of the school, next to the playground, etc.). Remember, you can include trees in your hunt too! If you have a map of your school, take it with you on your plant hunt.
2. Make up clues for the different plants that you found that describes them (clues that tell about color, texture, fragrance, blooms). Write down your clues.
3. Give your clues to another team so that they can go on a plant hunt too! Their goal is to find the plants by following your clues.

Plants found	Location of Plant	Plant Clue
(ex: Pecan tree)	(next to the gymnasium)	(ex: I produce a nut that is delicious in pies. I am located close to a building that rhymes with Tim.)

Now write your clues down on the Plant Explorers' Hunt form for another team or class to use.

Plant Explorers' Hunt

	Plant Clue	Answer
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Treats and Treasures from the Botanical World

Post Field Study Extensions

1. Create Your Own Game Show!

Students can create their own *Game Show*. Let children collect some common household items, and then discover what plant products are used in these items. Next, the children can make their own *Game Show* and their class mates guess which plants are in which products. Finally, the children can make a matching game where students match products to names of plants.

2. Research Other Explorers

Students can choose one of the following Explorers, and find out more about them by conducting research on the internet or at the library. What did they discover? When and where did they live? What are they most famous for? Students can create a poster with a picture of their Explorer and information about them. Students can also present their posters to each other in the classroom.

Explorers to choose from:

- John Cabot
- Vasco Nunez Balboa
- Juan Ponce de Leon
- Henry Hudson
- John Tradescant
- John Banister
- Mark Catesby
- John Clayton
- James Oglethorpe