A Geometric Activity involving the Great Smoky Mountains National Park
For 2nd Grade

Math Learning Goals:

- Understand there are different ways to divide a larger area into smaller areas.
- Compare, contrast and discuss the benefits of using different shapes to divide a larger area.
- Apply the practice of partitioning shapes into smaller shapes to a real world situation.

Materials Needed:

- Two Park maps – 2 per student
- Worksheet – 1 per student

Introduction:
The teacher will open up the class by handing out a colorful map of the Great Smoky Mountains National Park. The teacher will ask them what they see.

Student Answers:
There are many different colors.
They are different sizes.
There are seven different parts.
There are seven colors.

Activity:

After the students have identified all the parts and colors of the shape in the picture, tell students that this is actually a map of the Great Smoky Mountains National Park with different zones in different colors. Pass out the second park map. Tell the students that the rangers need their help. They are trying to divide up the total area of the park by figuring out how many circles or rectangles they need to cover the Park without getting too much of the outside area involved. The students can divide the park into the either circles or rectangles, but they get to decide which to use and how many.

Allow students to think for a little bit individually, then let them draw their ideas onto the first map. Then move them into groups of three. They should discuss their methods for covering the park, and they should decide whose idea is the best choice. After the students have completed their discussion, they will present their group's choice to the class. Each group presents.

After each group has presented, tell the students that their ideas will help the rangers to separate the park to find feral hogs (a type of wild pig) in the area to manage the population. At this point, talk to the students about the feral hog situation in the park. You might ask students if they have ever visited the park, or seen a wild hog there or elsewhere. For more information about feral hogs, go to the *background information* section.

Then, tell the students that the rangers appreciated their help again. Their shapes helped divide the

park into smaller areas, but only one ranger can search a specific shape a day. They need the students to divide their shapes into smaller regions in order for the rangers to be able to complete their task in a day. The rangers want to search as little outside of the park as possible. After partitioning the shapes, have the students shade the shapes the rangers need to search. Pick a few groups to explain their reasoning on their partitioning and shading.

Wrap-Up:

After the students have finished that activity, go back to the map that was given out at the beginning of class. Talk to the students about how this map is used to help find the locations of feral hogs based on trees and corresponding food in that area. Talk to the students about how dividing the park map into zones is another way of dividing up an area, but instead of looking at covering the most area, these divisions are based on the types and the numbers of trees in the area.

Background Information:

About Feral Hogs in the Great Smoky Mountains National Park

European Wild Boar, a type of feral (wild) hog, were brought to the United States in the early 1400s by settlers as a source of food. Since their introduction, these hogs have been expanding their range. In 1912, hunters near the Great Smoky Mountains National Park were looking for a new big game species. They imported European Wild Boar to populate a hunting preserve, and that population was left to breed and increase in number for several years. During this time some hogs escaped the preserve. The escapees bred with pigs in local farms and then wandered into a new home – the Great Smoky Mountains National Park – where they increased their number even more and spread throughout. Feral hogs cause a lot of damage in the Park to habitats and interfere with other animals and plants. They are considered to be an **invasive species**. An **invasive species** is any plant or animal that is not originally from a specific location (a plant or animal that has been brought from elsewhere by humans or other means) and has a tendency to spread, which causes damage to the environment.

The Great Smoky Mountains National Park has an area of a 2,080 square kilometers and straddles the border of Tennessee and North Carolina, the vast majority of which is undeveloped forest. Hogs in the park prefer to eat acorns, which fall from oak trees at the end of the summer.
They also eat tubers and roots, compete with the bear population, and sometimes eat salamanders. Note that the Park wants to preserve the wide range of salamander species, because the park is famous around the world for the great diversity of salamanders that live there. Managers of the park are trying to control the feral hog population.

2nd Grade TN Math Standards:

Geometry
2.) Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
3.) Partition circles and rectangles into two, three, or four equal shares, describe using the words, halves, thirds, half of, a third of, etc., and describe the whole two halves, three thirds, four fourths. Recognize that equal shares of identical whole need not have the same shape.

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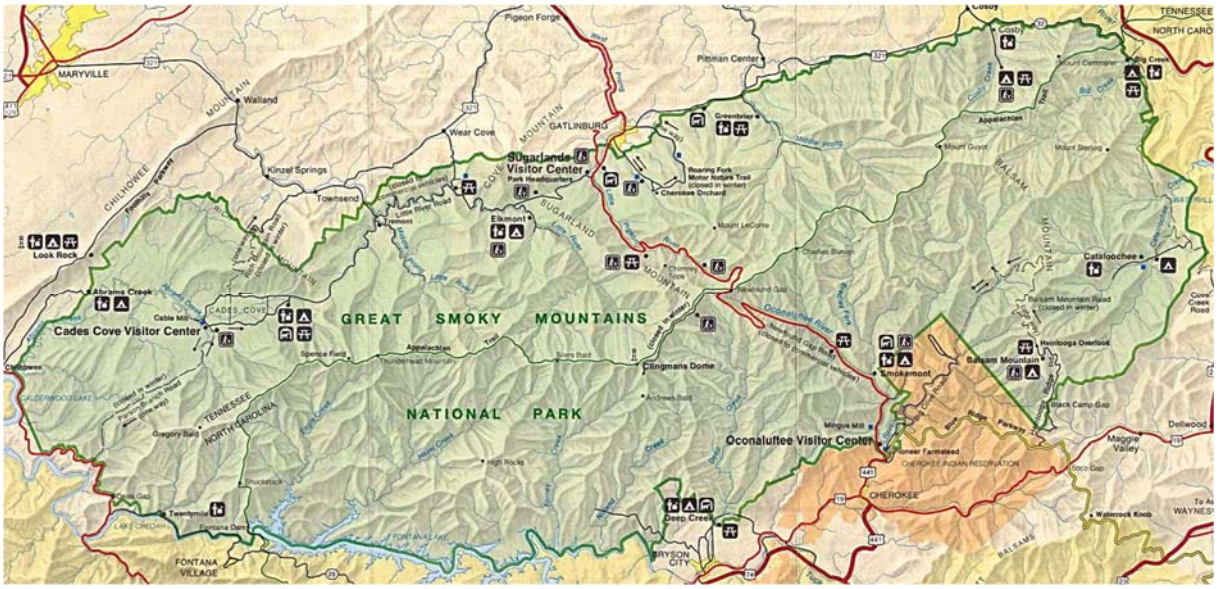
Name: _____

Finding the Feral Hogs



The rangers at the Great Smoky Mountains need your help. They are trying to figure out the best way to find feral hogs. They must divide the area into smaller rectangles or circles to cover the most area. They want to get as little area outside of the park boundary as possible. (The green area is the park).

1.) Which shape would you use and why?

2.) What shape did your group choose and why?

3.) Now that you have the park divided up, the rangers need your help dividing the area into smaller regions. The rangers can only search one shape each day, so they need your help making the area smaller so they can accomplish their task. Draw on your group picture the new divisions. Shade the new divisions that the rangers need to search.

Overstory Vegetation

Great Smoky Mountains National Park

1 0 1 2 Miles

1:100,000 Scale

Universal Transverse Mercator Projection, Zone 17
North American Datum of 1927

Forest

High Elevation and Montane Forest
- Fraser fir
- Red spruce
- Northern hardwoods
- Montane red oak-white oak

Low and Mid Elevation Forest
- Montane cove hardwoods
- Hemlock
- Montane alluvial
- Hardwoods
- Mesic oak hardwoods
- Chestnut oak type

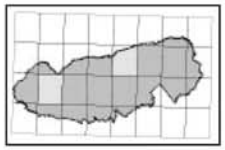
Woodland
- Sub xeric/Xeric oak hardwoods
- Pine with sub-xeric oak hardwoods
- Pine
- Shrubland
- Rhododendron, mountain laurel

Graminoid and Herbaceous
- Pastures and Fields

Additional Categories
- Wetland
- Sparse-successional vegetation
- Exotics
- Grape vine gap
- Rocks and sparse vegetation
- Mud
- Water
- Human influence
- Roads
- Park boundary

Richardson Cove
Jones Cove
Hartford
Waterville
Blockhouse
Kinzel Springs
Wear Cove
Gatlinburg
Mt. Le Conte
Mt. Guyot
Luftee Knob
Cove Creek Gap
Calderwood
Cades Cove
Thunderhead Mountain
Silers Bald
Clingmans Dome
Smokemont
Bunches Bald
Dellwood
Tapoco
Fontana Dam
Tuskeegee
Noland Creek
Bryson City
Whittier

United States Department of the Interior
National Park Service (NPS)



Index map showing 1:15,000-scale vegetation map series (dark gray) and corresponding digital datasets produced by the Center for Remote Sensing and Mapping Science (CRMS), The University of Georgia, from 1:12,000-scale color-infrared aerial photographs recorded in 1997/1998. Vegetation maps (light gray) produced by Aerial Information Systems (AIS), Redlands, California, and crosswalked to CRMS-NPS vegetation classes.

Map boundaries and names correspond to the U.S. Geological Survey 7.5-minute topographic quadrangles.

December 20, 2002