

## Harlan County Schools

### NTI Days 6-10

### "The U.S.A. Today"

### Grade Level 5

#### Introductions:

Beginning December 5<sup>th</sup>, any day designated as a Non Traditional Instructional (NTI) Day by completing work at home. On these days, we will not have to "make up" the missed days at the end of the school year. These days will count as a full day of instruction for students and teachers.

This folder contains snow packets for these NTI days for your child to complete if school is called to be a NTI day. Please keep the folder in a safe place at home. Every NTI day, have your child complete the work for the day specified by the County Board. For example: if the board specified that it is NTI day 1, look for the assignments labeled NTI day 1. Your child needs to hand in the work for this day within 5 school days. Students will receive participation grades based upon the work completed during each NTI day; therefore it is important that each student complete each day's work.

**\*\*\*\* Please don't feel pressured to purchase materials specifically for these assignments, use what you already have available at home. \*\*\*\***

These are just a reminder of the skills we are working on – they are **NOT** assignments. They are to help the teacher not the parents:

#### Standards:

##### ELA:

CCSS.ELA.Literacy.R.1.5.2

Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.

CCSS.ELA.Literacy. R.1.5.3

Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

CCSS.ELA.Literacy. W.5.7

Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

CCSS.ELA.Literacy. SL.5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

##### Science:

5-ESS21-1

Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

3-5 ETS1-1

Define a sample design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time or cost.

3-5 ETA1-2

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of a problem.

5-ESS3-1

Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Math:

5.NF.6

Solve real world problems involving multiplication of fractions and mixed numbers, e.g. by using visual fraction models or equations to represent the problem.

5.NBT.7

Add, subtract, multiply and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between and subtraction/ relate the strategy to a written method and explain the reasoning used.

Social Studies:

SS-05-4.1.2

Students will use geographic tools to locate and describe major landforms, bodies of water, places, and objects in the United States by their absolute location.

SS-05-2.3.2

Give examples of conflicts between groups/individuals and describe appropriate conflict resolution strategies (e.g. compromise, cooperation, communication).

SS-05-2.3.2

Students will give examples of conflicts between individuals or groups to describe appropriate conflict resolution strategies (e.g. compromise, cooperation communications).

Activities:

Day 6: Geography of the United States

**\*\*\*\*\*You MUST choose 3 of the 5 activities to complete (but you don't have to do all 5 activities) \*\*\*\*\***

Activity:

1. Using the internet and link provided ( <https://www.youtube.com/watch?v=77ENELQUIf4> ), watch the video about the water cycle and create and label your own water cycle diagram.
2. At the beginning of the video, you may have noticed that the video participants were on the Colorado River in Moab, Utah. Using the internet, find the absolute location (latitude and longitude) of Moab, Utah and two other points along the Colorado River ( <http://www.latlong.net/> use this website)

3. Read the attached article: "Where is the United States Located?" Write a one paragraph summary of the nonfiction article describing the key details/main ideas in the article.
4. The Cumberland River is 688 miles long. The Smith family wants to canoe half of the river on their vacation. They canoe 62.4 miles the first day, 76.9 miles the second day. How many miles will they need to canoe on the third day? Explain how you found your answer.
5. Your body will need 3450 calories for the trip. Go into your kitchen and make a list of what foods you will take on your canoe trip and the total number of calories in each item. Be sure the items you list are items that you could carry in a backpack with you. Now add all of your calories up; will you have enough calories for your trip? Explain your answer.
6. Look at the list of landforms of the United States. What landforms do you see in your community? Create a diorama (a scene, often in miniature, reproduced in three dimensions by placing objects, figures, et, in front of a painted background) of the landforms in the areas area around your house.

Day 7: Economy

**\*\*\*\*\*You MUST choose 2 of the 4 activities to complete (but you don't have to do all 4 activities) \*\*\*\*\***

Activity:

1. Open for Business: You are going to start your own business. Choose one of the following options:
  - Lemonade Stand
  - Yard Sale
  - Mowing Lawns
  - Car Wash

Now, make a list of the materials you will need for your business. Estimate the cost of each material. Don't forget advertising and other expenses. Decide how much to charge for your products. Estimate the total income. Estimate your gross income for the day (how much will you make today?) Estimate your profit (subtract total costs from gross income).

Car Wash	
Costs	Income
Detergent: \$3.75	Price: \$3.00 per car
Sponges: \$4.75	Plan for 8 cars per hour
Buckets: \$6.75	Gross Income: \$168.00
Rags: donated	Profit: \$152.75

2. **Grow Your Business:** Think of some things you are skilled at. List your skills and interests. Then think of a business that provides goods and services. Create a flyer to advertise our business. Be sure to include an illustration, color, etc. to make your flyer attractive!

**ARE YOU POOPED?**

Then call Sasha's Pooches: a first class, dog-walking service!!!! We Will:

- Arrive at your home
- Make friends with your dog(s)
- Exercise your canine friends for 20-40 minutes
- Feed your dogs
- Give your pets lots of love

Fees:

\$15.00 dollars per hour

**CALL: 555-45-23**

Available from 2:30pm to 5:30pm

**Remember: A SASHA'S POOCH IS A HAPPY POOCH!!!!!!**

3. Your 6 person family is taking a 5 day trip to Washington D.C .Choose 3 landmarks that your family will visit from the following list:

- Lincoln Memorial - \$10.00 per person
- Washington Monument - \$10.00 per person
- International Spy Museum - \$10.00 per person
- Holocaust Museum - \$12.00 per person

How much money will the family spend visiting the sites that your family has chosen? Explain how you got your answer.

4. Watch the Brain Pop Video on "Budgets". Take the review quiz and submit your results via email. <https://www.brainpop.com/socialstudies/economics/budets>

Day 8: American Citizen Ship

**\*\*\*\*\*You MUST choose 2 of the 4 activities to complete (but you don't have to do all 4 activities) \*\*\*\*\***

Activity

1. **Be a Good Citizen:** Teachers, elected officials, doctors and police officers are all considered public servants. They all demonstrate exceptional citizenship! In an informative essay, explain

how those public servants demonstrate good citizenship. Use the 5-paragraph essay outline as a guide for your writing.

2. List 5 ways that you, a student your age, can volunteer in your community. Choose one of these activities and volunteer today! Take a photo of yourself doing this volunteer work. Volunteer service could be as simple as helping an elderly neighbor, shoveling snow, or volunteering at a local business. REMEMBER VOLUNTEERS DON'T ACCEPT PAYMENT (MONEY) FOR THEIR SERVICES (WORK)!
3. Using the internet find a famous American (actor, singer, leader, etc.). Create a poster using pictures from the internet with descriptions about this famous American's life.
4. Using the internet, create a list of 10 famous American's and their contributions. Choose one of them to write a letter thanking them for their contribution. Make sure you tell them why their contribution is important and how it has affected your life.

#### Day 9: Conflict Resolution

**\*\*\*\*\*You MUST choose 2 of the 4 activities to complete (but you don't have to do all 4 activities) \*\*\*\*\***

#### Activity:

1. Read the article: "When Mountains Move" about mountain top removal with an adult in your household. What were some of the problems that Judy Bonds and her family encountered in the article, as a result of the mountain top removal in her community? Come up with three reasons arguing in favor of or against mountain top removal. Have your partner take the opposing position/side – film/video your debate.
2. Interview a person about mountain top removal. Create a set of 7 questions and conduct your interview with a neighbor, grandparents, and parents, etc. Record your interview using your phone.
3. Go to Brain Pop and review how to add and subtract fractions. Now imagine that a mountain was  $\frac{4}{5}$  of a mile long.  $\frac{1}{2}$  of the mountain was removed. They claimed to have  $\frac{3}{10}$  of the original mountain left. Explain how you know whether their claim is reasonable.
4. Read the article "Super Smog in China". According to the article, the smog in China is being caused by the excessive burning of fossil fuel like coal. Using the information from the article and further research take a stance on the burning of coal. Is burning coal more helpful or harmful? Take a stance and use three reasons to support your opinion.

#### Day 10: Project – Create a Brochure

- As your cumulative (end of NTI days) project you will create an informative brochure over one of the following topics:
  - Mining in the United States
  - The American People
  - Across the U.S.A. (geography of the U.S.A.)
  - Starting a Business

Use the information you have gathered over the course of the past 4 days to help create your brochure.

- The brochure should include a title, artwork/pictures on front that supports the title, 3-4 details (inside) about the topic (e.g. – illustrations, descriptions, charts/graphs, pictures, maps, text features, etc.). Optional (or work that you can include but don't have to)/additional information to include website links.
- If you would like, you may create your brochure online using the following web-page:  
[http://www.jukeboxprint.com/editor/brochure\\_creator.php](http://www.jukeboxprint.com/editor/brochure_creator.php)

# Where is the United States Located ?

The United States is located in the Northern and Western hemispheres, on the continent of North America. Look at the map and notice that the country of Canada forms the northern border of the United States and the country of Mexico borders our nation to the south. The United States goes from the Pacific Ocean on the west to the Atlantic Ocean on the east. As the song says, America goes "from sea to shining sea."

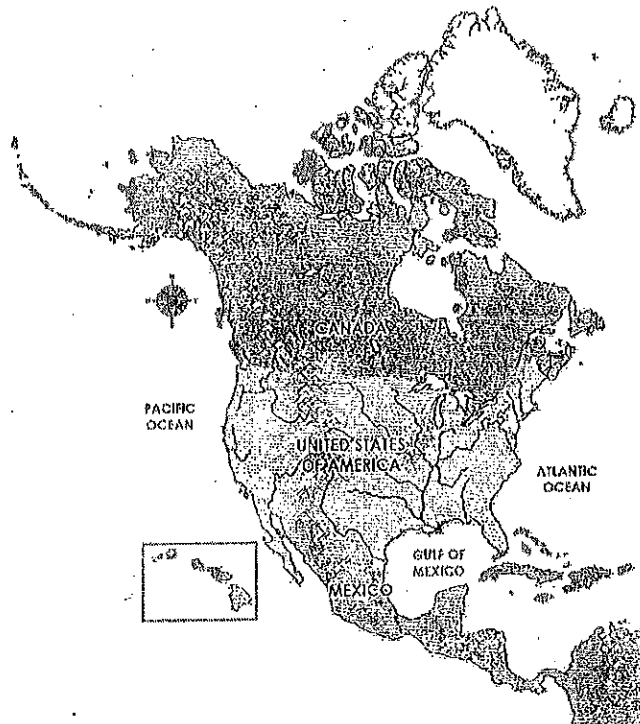
Day 6

## Major Landforms of the United States

On the other map, notice that there are several important landforms marked.

## Rivers and Lakes

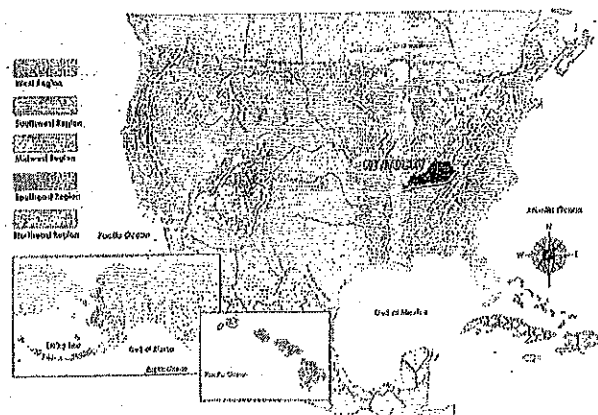
Some of our nation's biggest rivers include the Columbia River, the Mississippi River, the Missouri River, and the Rio Grande. See if you can find these large rivers on the map. The map also shows the Great Lakes, made up of Lake Superior, Lake Michigan, Lake Huron, Lake Erie, and Lake Ontario. These lakes are found at the northern part of the United States, near Canada.



## Mountain Ranges

The largest mountain ranges in the United States are the Rocky Mountains, the Cascade Range, the Sierra Nevadas, and the Appalachian Mountains. There are other smaller mountain ranges that aren't marked on this map. We will talk about other landforms, such as plains, deserts, and valleys, in other issues of the magazine.

## Regions of the United States



The United States is divided up into five regions, or areas that share common landforms. A landform is a geological formation, such as a mountain range, a river or a desert. Each of these five regions shares the same types of landforms and climates. Climate is the kind of weather that a place has over a long period.

The five regions of the United States are the Midwest, the Northeast, the Southwest, the Southeast, and the West. (These regions are marked for you on the map) The land in each of these regions shares certain landforms. For example, the Midwest has beautiful, rolling prairies with rich, fertile farmland and warm summers with cool winters. The Southwest, however, is very dry and covered by areas of desert where most plants can't grow. Each region has its own landscape and climate.

## Kentucky's Place in the United States

Kentucky is part of the southeastern region of the United States. The Southeast has rolling hills, rugged mountains, and valleys with rich soil for farming. Several large rivers, as well as beautiful forests, cut through the mountains.

Kentucky is bordered by Virginia and West Virginia to the east, Ohio, Indiana, and Illinois to the north, Missouri to the west, and Tennessee to the south.

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# Super Smog in China

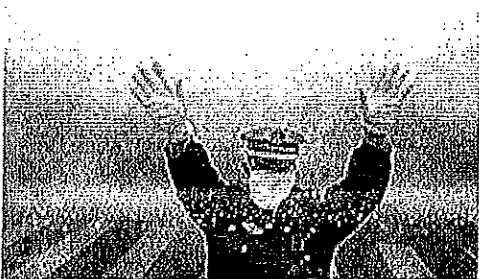
Officials close schools and ground flights as dense smog shrinks visibility in Harbin, a city in China

OCT 21, 2013 | By Kelli Plasket with TIME and AP reporting



A woman wearing a face mask to block out the smog uses her mobile phone in Harbin, a city in northern China.

Winter is coming to northern China—and with it, another season of heavy smog. Smog is a hazy blend of smoke and fog caused by pollution in industrial areas. On Monday, in the large city of Harbin, small-particle pollution rose to a record 40 times higher than what is considered to be safe by the World Health Organization (WHO). The thick haze caused visibility to fall to less than half a football field, grinding the city to a halt.



A police officer works on a street blanketed in heavy smog in Harbin on October 21, 2013.

When Wu Kai, a 33-year-old Harbin resident, looked out her apartment window on Monday, she couldn't see anything. At first, she thought it was snowing. Then she realized it was smog. Her husband left for work wearing a mask to cover his mouth and nose and stop him from breathing in the pollution. His regular bus wasn't running because of the low visibility. "It's scary, too dangerous," Kai told the Associated Press. "How could people drive or walk on such a day?"

Many people can't get around. Authorities in the city closed primary and middle schools and some highways on Monday. Harbin's Taiping International Airport canceled or delayed at least 40 flights.

### **Smog Season**

Northern China experiences year-round air pollution from factory emissions and the huge number of vehicles on the road. Typically, the air pollution is at its worst in the winter, when more coal is burned to heat homes and buildings. Harbin's municipal heating systems kicked in on Sunday. On Monday, visibility was down to less than 55 yards, according to state media.

China's environmental protection agency monitors the level of harmful particles in the air. The agency saw readings as high as 1,000 micrograms per cubic meter at several monitoring stations in Harbin on Monday. WHO says a safe level is 25 micrograms per cubic meter.

### **Pollution Problems**

China's major cities have some of the world's worst smog. Record levels of air pollution crippled Beijing, the capital, for weeks last winter. The Chinese government, which had long ignored the problem, is finally taking notice. In September, China's Cabinet announced a plan that aims to reduce the country's heavy reliance on coal to below 65 percent of total energy usage by 2017. Last week, Beijing also announced a set of color-coded emergency measures for bad pollution days.

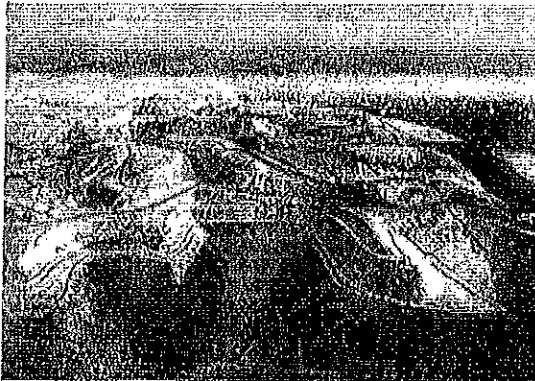
Fixing the pollution program will be costly for the Chinese government. Officials say the country will need to spend nearly \$817 billion to fight pollution. But the cost of ignoring it could be much worse.

# "When Mountains Move"

Republished from the pages of *National Geographic* magazine  
Written by John G. Mitchell  
March 2006

Day 9

*Coal brought people to Marfork hollow in the Appalachian Mountains of southern West Virginia. And it was coal, or rather a different way of mining it, that finally drove the people away. The last to leave was Judy Bonds.*



## **Mountaintop removal mine in West Virginia**

A coal miner's daughter whose roots here go back nine generations, Bonds packed up her family and fled when she could no longer tolerate the blasting that rattled her windows, the coal soot that she suspected was clotting her grandson's lungs, and the black water spills that bellied-up fish in a nearby stream. Retreating to the town of Rock Creek, a few miles downstream, Bonds joined Coal River Mountain Watch, a citizens group determined to oppose surface-mining abuses.

In the years since Bonds moved, coal companies have turned to an even more aggressive mining process known as mountaintop removal. After clear-cutting a peak's forest, miners shatter its rock with high explosives. Then they scoop up the rubble in giant draglines and dump the overburden, as they call it, into a conveniently located hollow, or valley. The method was first tested in Kentucky and West Virginia in the late 1970s and has since spread to parts of Tennessee and Virginia.

"What the coal companies are doing to us and our mountains," said Bonds when she and I first met years ago, "is the best kept dirty little secret in America."

Now the secret is out. Coal companies have obliterated the summits of scores of mountains scattered throughout Appalachia, and more and more folks like Judy Bonds are decrying the environmental and social fallout of what some refer to as strip mining on steroids.

Not only is mountain topping less labor intensive than underground mining, it is also more efficient and profitable than the older form of surface mining, in which the operator stripped away the horizontal contours of a mountainside as one

might peel an apple. So fast has the practice spread that there's no accurate accounting of the area affected, but surface mining in general has impacted more than 400,000 acres (1.6 square meters) in this four-state Appalachian region, including more than 1,200 miles (19,312.1 kilometers) of streambeds. If the practice continues until 2012, it will have squashed a piece of the American earth larger than the state of Rhode Island.

In the years since high-tech earthmoving machinery made mountain topping increasingly attractive to the energy industry, more and more of West Virginia's total production of coal—some 154 million tons (139.7 million metric tons) in 2004—has come from its decapitated highlands. Relative to Western coal (Wyoming is the nation's top coal producer), second ranked West Virginia's low-sulfur bituminous burns with a cleaner, hotter efficiency in the electric power plants of America. And taxes from bituminous coal help fuel a large part of the state's economy.

But some West Virginians have been paying a hurtful price for their state's good fortune—and the coal industry's cost-cutting efficiency. In 1948 some 125,000 men worked in the mines of West Virginia. By 2005 there were fewer than 19,000, and most of these were employed in underground mines. Nowadays, it just doesn't take many hands to wrestle coal off the top of a mountain.

Consider, for example, the Big Coal River community of Sylvester, where fewer than 20 of its 195 longtime residents are employed in mining or related services. And consider Sylvester resident Pauline Canterbury. She lives in a small house just a quarter mile (0.4 kilometers) down State Route 3 from a coal-washing plant operated by the Elk Run Coal Company, a subsidiary of Massey Energy, West Virginia's premier producer. Canterbury has been waging a decade-long battle with Massey and state and federal regulators over the volume of coal dust wafting from the Elk Run facility and sifting under the sills of Sylvester's homes. She has personal reasons for being concerned about the quality of the air. Her father, Ernest Spangler, died in 1957 from silicosis. His job had been putting out mine fires with buckets of pulverized rock dust. Then in 1991 her husband, John D. Canterbury, died of black lung disease after years of working in underground mines.

"When I was young, Sylvester was the place to be," Canterbury said. "Everyone wanted a home here because the town was so clean. It wasn't a company town. But then Massey came into the valley, and it's been downhill ever since—in more ways than one. Now they'll take 300 feet (91.4 meters) off the top of a mountain just to get at a few feet of coal."

After a long succession of petitions and hearings, 150 Sylvester residents prevailed in their case against Elk Run, forcing the company to pay the litigants economic damages of nearly half a million dollars and requiring it to maintain a dust-trapping dome over its processing plant and to limit the number of coal trucks passing through town to an average of 20 a day. Despite these concessions, Canterbury and some of her activist neighbors are worried about Massey's plans to expand its Elk Run operations. (Massey representatives did not return repeated phone calls requesting information on its record at Sylvester.)

Several years ago the director of the state's Division of Mining and Reclamation issued a memorandum showing that for the years 2000 and 2001 Massey incurred 500 violations, more than twice the number accumulated by the state's next three largest producers combined. Sixty-two of those violations, most involving excessive coal dust emissions, were attributed to the Elk Run Coal Company at Sylvester.

I grew up beholden to West Virginia bituminous coal. My parents' house in Cincinnati was heated by it until they switched to oil in 1945. The coal came down the Ohio River by barge, and every wintry month or so a dump truck would deliver a big pile beside our garage. I remember helping my father cart it to the furnace inside, and the grating screech of his shovel on the cellar floor. And I remember the trail of black soot and the coal dust on my shoes. I was grateful for the warmth the coal gave us, but I hated it too because it was dirty. This was before public health and clean-air regulations obliged the mining industry to wash coal and, in Appalachia at least, dispose of the dust, dirt, and wastewater in impoundments, often perched precariously on the sides of the mountains.

There are some 500 of these impoundments in Appalachia today, more than half in Kentucky and West Virginia. Various referred to as slurry ponds, sludge lagoons, or waste basins, they impound hundreds of billions of gallons of toxic black water and sticky black goo, byproducts of cleaning coal, mostly from underground mines but also from surface mines. Mountain folk residing downhill from these ponds worry about what a flood of loose sludge might do—and has already done in a number of tragic cases.

In Logan County in the winter of 1972, following two straight days of torrential rain, a coal-waste structure built by a subsidiary of the Pittston Coal Company collapsed and spilled 130 million gallons (492 million liters) into Buffalo Creek. The flood scooped up tons of debris and scores of homes as it swept downstream. Survivors recalled seeing houses bob by, afloat in the swift current, the doomed families huddled at their windows. The final count was 125 dead, 1,000 injured, 4,000 made homeless. The Pittston Company called the disaster an "act of God."

In neighboring Kentucky on an October morning in 2000, the bottom of a waste pond near the town of Inez collapsed, pouring 250 million gallons (946 million liters) of slurry—25 times the amount of oil spilled in the Exxon *Valdez* disaster—into an inactive underground mine shaft. From there, the slurry surged to the mine's two exits and flooded two creeks hell-bent for the Tug Fork of the Big Sandy and the Ohio River beyond. Miraculously, there was no loss of human life, though 20 miles (32.2 kilometers) of stream valley would be declared an aquatic dead zone, water systems in ten counties would have to be shut down, and the black slick would eventually reach out toward the riverfront in Cincinnati. Lawyers for the Martin County Coal Company, a Massey subsidiary and owner of the impoundment, blamed the accident on excessive rainfall, which was simply another way of saying what had been said at Buffalo Creek. It was God's fault.

Fear of impoundment failures haunts the collective memory of West Virginians. "I'm convinced something awful's going to happen again," Freda Williams was saying the day I called on her at her tidy brick house beside a tributary of the Big Coal River, just south of Whitesville. One of the largest waste basins in the state,

the Brushy Fork slurry lagoon, owned by Massey Energy, impounds some eight billion gallons (30.2 billion liters) of blackwater sludge about three miles (4.8 kilometers) upstream from Williams's home.

"What's going to happen to all that water if the dam breaks or the basin collapses into an abandoned underground mine?" By some accounts, should the Brushy Fork impoundment ever fail, a wave of sludge 25 feet (7.6 meters) high could roll over Whitesville in no time flat.

Two other Massey waste impoundments pucker the slopes of the Big Coal Valley. The one at Sundial looms directly above the Marsh Fork Elementary School, with an enrollment of 240 children, from kindergarten through fifth grade. Though Stephanie Timmermeyer, chief of the state's Department of Environmental Protection, has claimed that the Massey facility poses no threat to the schoolchildren, the agency's own rating system lists the dam as a Class C facility, meaning its failure could reasonably be expected to cause loss of human life.

Besides the raw scars of the mines themselves, the most startling features of coal country are not necessarily those blackwater basins but the mountain-topped valley fills that have buried hollows and headwater streams under millions of tons of broken rock. Critics fear some fills could eventually come tumbling down in landslides of unpredictable proportions. As one Kentucky attorney likes to put it: "A valley fill is a time bomb waiting to happen."

One of West Virginia's biggest time bombs reaches more than two miles (3.2 kilometers) down what used to be, when it was flowing free, the Connelly Branch of Mud River in Lincoln County. The fill represents part of a mountaintop the Arch Coal Company unhinged to create the 12,000-acre (48.6-square-kilometer) Hobet 21 mine, one of the largest surface mines in West Virginia. But Hobet 21, now owned by Magnum Coal, has another distinction: For several years it's been home to "Big John," an earthmoving machine with a 20-story dragline and a bucket scoop that swallows over 100 tons (90,718.5 kilograms) of soil and rock in a single bite.

Up the Mud River a short way, a tributary known as Laurel Branch flows sweet and clear beside a weathered white-frame farmhouse. The front porch overlooks a garden of corn and potatoes. From the porch in the spring you can hear the vernal murmur of the creek, though not when the farmhouse is crowded, as it was at the time of my visit, with kin of the Caudill-Miller clan gathered at a place that has been in the family for a hundred years. Leon and Lucille Miller preside as host and hostess for these occasions. She is one of the surviving heirs of John and Lydia Caudill, who inherited 75 acres (303,515.4 square meters) abutting the Mud and built this farmhouse in 1920. Lucille was raised here, along with nine siblings. But now, for all the copious country food and Caudill hospitality, an explicable uneasiness lingered at the edge of the festivities. Moving to expand its Hobet 21 operation, Arch Coal had informed the Millers that it was looking to do with Laurel Branch what it had done to the Connelly. And Arch wanted the Caudill homeplace out of the way.

"They want it all," Leon Miller told me, "the house and everything. And we're saying, 'No.'"

Since that particular May reunion a few years ago, I have been following the ups and downs of the Millers' struggle to stop Arch Coal from burying Laurel Branch and the ancestral home under the shadow of Hobet 21. Arch did succeed in buying out some of the Caudill heirs, thereby acquiring a two-thirds interest in the 75 acres (303,515.4 square meters). But when Lucille Miller and six of the heirs continued to say "no," Arch's Ark Land Company filed a lawsuit in Lincoln County Circuit Court arguing that the holdouts should be forced to sell their interests because coal mining was "the highest and best use of the property" and because the cost of protecting the nearby Miller-Caudill land from mining waste would be prohibitive for Arch. Besides, the company's attorneys said, the heirs did not live at the farm but used it only on weekends and other occasions. The circuit court ruled in the company's favor and ordered the property sold at auction. Arch got it. The Millers appealed to the state supreme court and won a reversal of the lower court's ruling. The farmhouse still stands, and the Laurel still murmurs, at least for now.

While Millers and Caudills rallied round their embattled homeplace, a larger but not unrelated issue was unfolding in federal courts and among the agencies responsible for regulating coal mining under the Clean Water Act and the Surface Mining Control and Reclamation Act of 1977 (SMCRA). Under "Smackra," as the act is known, environmentalists contend that the U.S. Office of Surface Mining should enforce a buffer-zone rule prohibiting, in all but the most exceptional cases, any mining activity within one hundred feet (30.5 meters) of a stream. Under the Clean Water Act, the Army Corps of Engineers was supposed to regulate the actual filling of the streambed itself. Perceiving a lack of enforcement on both counts, opponents of mountaintop mining in West Virginia have been in and out of court for the past five years, occasionally winning a legal round only to have it set aside on appeal by attorneys for various agencies and the coal industry.

In or out of the courtroom, the argument often boils down to differing opinions as to what constitutes a regulated stream in Appalachia, how vital its uppermost reaches might be to the ecological health of the downstream watershed, and finally the degree to which valley fill might contribute to flooding in a peak storm event.

The defenders of valley fills argue that most of these structures affect intermittent streams only and therefore do not fall within the reach of the Army Engineers and the Clean Water Act. William Raney, president of the West Virginia Coal Association, believes many fill areas are simply "dry hollows" for most of the year, implying that they serve little ecological function.

But that's not the way Ben Stout, a biology professor at Wheeling Jesuit University, sees it. According to Stout, aquatic insects in seep springs at the top of a watershed feed larger life-forms by shredding leaf litter and sending the nutrient-rich particles downstream. "These insects provide the link between a forest and a river," Stout says. "Bury their habitat and you lose the link."

The issue of flooding also evokes conflicting views. Raney sees no connection between mountaintop mining and floods. "Science doesn't bear that out," he told

me during an interview in his Charleston office. "What causes flooding is too much water falling in too short a time."

Yet a study by federal regulators, obtained by the *Charleston Gazette* through the Freedom of Information Act, predicted that one valley fill at the Hobet 21 mine could increase peak runoff flow by as much as 42 percent. Vivian Stockman, a project coordinator with the Ohio Valley Environmental Coalition in Huntington, contends that 12 West Virginians have died since 2001 because of floods related to mountaintop mining. "Old-timers will tell you property that has been in their families for generations never flooded severely until mining began upstream," Stockman says. "It's common sense. Denuded landscapes don't hold water the way forests do."

It was not the intent of Smackra, of course, to allow coal companies to walk away from their surface mines and leave them denuded. Stripped mountainsides, the law declared, must be restored to their "approximate original contour" and stabilized with grasses and shrubs, and, if possible, trees. But putting the entire top of a topped-off mountain back together again was an altogether different—and more expensive—matter. So mountaintop mines were given a blanket exemption from this requirement with the understanding that, in lieu of contoured restoration, the resulting plateau would be put to some beneficial public use. Coal boosters claimed the sites would create West Virginia's own Field of Dreams, seeding housing, schools, recreational facilities, and jobs galore. In most cases it didn't work out that way. The most common "use" turned out to be pastureland (in a region ill-suited for livestock production) or what the industry and its regulators like to identify as fish and wildlife habitat.

"The coal companies have stripped off hundreds of thousands of acres," says Joe Lovett, an attorney for the Appalachian Center for the Economy and the Environment, "but they're putting less than one percent of it into productive use."

Yet the industry should get some credit for what it's managed to accomplish in postmining land use over the years. It's provided a number of West Virginia counties with the flat, buildable space to accommodate two high schools, two "premier" golf courses, a regional jail, a county airport, a 965-acre (3,906,169.5 square meters) complex for the Federal Bureau of Investigation near Clarksburg, an aquaculture facility, and a hardwoodflooring plant in Mingo County that now employs 250 workers.

"Economically, we were dying on the vine," said Mike Whitt, executive director of the Mingo County Redevelopment Authority, as we toured the 40-million-dollar flooring plant, financed by grants from federal, state, and local governments and by private investors. "So we got OPM—other people's money—to get the job done. Without the infrastructure to create jobs, you're out of the game."

One emerging idea to help keep this underemployed region in the game is commercial forestry—restoring the land not as pasture or golf course or school but as a reincarnation of what used to be here in the rich diversity of the Appalachian forest. Arch Coal, with test plantings already established east of Whitesville, reports it's eager to pursue this option. "Our intent," says Arch's Larry Emerson, "is not just to approximate what was there before mining but, for the long range, establish a commercial forest."



Some foresters are not convinced that Arch is willing to go far enough in its romance with reforestation. James Burger, a professor of forestry at Virginia Tech University and a zealous proponent of turning topless mountains into productive forests, has found in his studies that weathered brown sandstone soils—making up a mountaintop's uppermost layer and therefore the first to be dumped and lost in a valley fill—would be better set aside and used, without compaction, as top dressing for any reforestation. But Arch's forestry consultant argues this would raise substantially the per-acre cost of reclamation.

A few environmentalists, such as Joe Lovett of the Appalachian Center, hail Burger's crusade for reforestation as the next best thing to stopping mountaintop mining altogether. Others view it as a cop-out exercise in wishful thinking. "I understand what makes up that forest, and it's not just trees," says Judy Bonds of Coal River Mountain Watch. "I'm talking about the herbs and the plants that evolved here in this forest over thousands of years. Recreate *that* forest? You couldn't do it in 1,500 years."

Standing in the doorway of the Mountain Watch office on the main street of Whitesville, I listened to Judy Bonds reminisce about the way it was 50 years ago when she was a child. "I used to swim in the Coal River then," she said, "but now it's so full of silt that the water barely comes up to your knees. It breaks my heart. I look at my grandson, and I see that he's the last generation that will hunt and fish in these mountains and dig for ginseng, and actually know mayapple when he sees it. These mountains are in our soul. And you know what? That's what they're stealing from us. They're stealing our soul."