



Learning is FUNdamental at Antietam Recreation and your students are going to have a great time! It is a “hands on” experience in areas all across the curriculum including Physical Education, Science, History, the Arts, and much more.

We desire that your time spent here will draw your school closer together and will provide an exciting, educational and fun filled day!

BRING LEARNING TO LIFE!

PHYSICAL EDUCATION: Students will be able to experience unique PE activities such as; riding horses, paddling canoes and kayaks, going swimming, playing tennis and badminton as well as challenge and adventure activities including rope swings, tight ropes and the Burma bridge. Also included are some fun and recreational activities in our game room like air hockey, table tennis, foose ball, and bumper pool. These activities involve educational instruction as students are taught how to hold paddles, put on lifejackets, get in and out of boats, mount and dismount horses, hold reins, apply leg pressure, and numerous other procedures to insure their own safety and that of their classmates. Some schools start their day with a cross country run and fitness events to fulfill the Presidential Physical Fitness Test or just to encourage fitness.

ANIMAL SCIENCE: Antietam Recreation's large number of live, caged, and stuffed animals and birds provide many science education experiences. The petting zoo allows students to pet, hold and feed animals. Included are domesticated animals such as sheep, goats, rabbits, kittens, pigs, ducks, chickens, puppies and some unique caged animals like the squirrel monkey, fennec fox, coati mundi, genet, macaw talking bird, ponies, donkey, and llama. Antietam Recreation also has a bird collection that is over 100 years old that includes a Caroline Parakeet, and Passenger Pigeon both now extinct, plus numerous other varieties. A butterfly, moth, and insect collection as well as numerous stuffed animals, including reptiles (rattlesnake, snapping turtle,) fish (shark, flying fish, saw fish) mammals (mink, fox, bat, skunk) and many other collections. A walk or jog along one of the many nature trails along Antietam Creek where deer, red fox, and numerous wildlife abound is also an educational experience.

PHYSICAL SCIENCE: Many Scientific Principles are working at the specialized activities such as the boat slide (flume ride), cable ride, rope swings, Burma bridge, barge, carousel ride, downhill slide, swinging bridge, and boating activities.

AMERICAN HISTORY & THE ARTS: The day always includes a 20 minute dramatic production including, dance, music and singing. This not only includes world class entertainment but dramatic performances by young performers the age of many of the students. Some classes studying early American History and the settling of the West have been educated on the role of the cowboy. World Champion and Guinness World Record Holder Andy Rotz will demonstrate the tools of the cowboy. With expert precision he will amaze students with his ability to safely rope, whip, throw knives and hatchets, and ride his trick horse. A wagon ride through our authentic western town makes the Wild West come alive.

OTHER EDUCATIONAL AREAS: Activities in Math, Environmental Education, English, Writing, and Play acting and other subjects may be developed to fit into your curriculum by working individually with our staff.

Please let us know if you are planning an educational trip to our facility so we can better tailor it to fit your needs. Activity sheets are included below which can be reproduced for your staff either before or after your field trip to Antietam Recreation.

BIRDS-THEIR FEET AND BILLS

One of the best ways to understand birds, their habitats, their diet, and their ability to survive is to observe the feet and bill. Bird feet come in a variety of shapes and sizes and are used in a variety of ways. The bill is a specialized instrument that enables the bird to get at the type of food that forms its diet. It's also used for gathering nesting material, digging nesting sites and preening and smoothing the plumage. Whether small or large, delicate or strong, it is just right for each bird.

FEET	BIRD	CHARACTERISTIC
Climbers	Woodpeckers	Two toes in front and two toes in back
Graspers	Hawks and owls	Large curved sharp claws (talons)
Perchers	Robins, doves, songbirds	Three toes forward and one backward
Runners	Ostrich, roadrunners, killdeer	Two and three toes all point forward
Scratchers	Pheasants and chickens	Rake like toes
Swimmers	Ducks and coots	Webbed paddle like feet
Waders	Flamingoes and herons	Splayed toes



Grasper-
Eagle



Percher-
Robin



Swimmer-
Duck



Wader-
Snipe



Climber-
Woodpecker

NOW YOU DECIDE

Habitat	Bird	Foot Type	Why?
Desert			
Grassy Waters			
Mountain			
Open Prairie			
Woodlands			

BILLS	BIRD	CHARACTERISTIC
Flesh Tearing	Hawks, owls, eagle	Meat hook to tear its food into strips
Insect Eater	Woodpecker	Chisel digging into wood to reach insects
Seed Eater	Sparrow, cross bills	Like pliers to pry seeds from cones
Sifter	Flamingo, ducks	Beak and tongue work like a sieve
Spearing	Herons, penguin	Dagger for stabbing fish
Sipping	Hummingbirds	Straw for sipping nectar from flowers
Hooked	Parrots	For eating fruits and seeds



Flesh Tearing-
Hawk



Spearing-
Heron



Seed Eater-
Sparrow



Sifter-
Duck



Insect Eater-
Woodpecker

Did you know? The largest beak is on the pelican. The pelican's beak is an average of 18 inches long. Swifts have the shortest beaks, just one-quarter of an inch long. The longest beak, in relation to the size of the bird, is the sword-billed hummingbird. The little hummingbird's bill is just over four inches long, not much shorter than its tiny body!

NOW YOU DECIDE

	Bill Type	Types of Food
Desert		
Grassy Waters		
Mountain		
Open Prairie		
Woodlands		

BOAT SLIDE

What scientific principles are working at the BOAT SLIDE ?

Potential Energy (PE) The boat has potential energy at the top of the slide. That PE is converted into Kinetic Energy (KE) as the boat moves down the slide. When the boat hits the water the KE is converted to heat by the friction of the boat moving through the water.

Force is necessary to move the boat. Force is the push or pull that starts an object. Newton's Second Law states that force is equal to the mass of an object multiplied by its acceleration. Force is required to make the boat move down the flume and overcome friction.

Gravity is the force from the earth that starts the boat to move down the hill. The pull from the tractor must be greater than the force of gravity, in order for the boat to be pulled up the flume.

Friction is caused by the boat rubbing against the wooden flume (ramp). Friction has been lessened by adding four wheels at the bottom of the boat, and having the water on the flume.

Inertia is when the boat hits the water, it continues to move because of its inertia. It will move until friction with the water, and the pull from the rope causes it to stop.

Displacement Theory : The boat floats because it is pushed up by a force equal to the weight of the water displaced by the boat. When the boat hits the water it weight less than the water; therefore, it displaces the water and the force of the up thrust will keep the boat and its load afloat. If the boat and its passengers weigh more than the water they displace, then the boat will sink). That's why we recommend the boat be loaded with 500 pounds or less.

Water in Creek + Boat = This much water is displaced.

It has the same mass as the boat and the riders.



Inclined Plane is the flume. The steeper the inclined plane, the greater the force of gravity. (The first 40 feet, the incline is a 6-12 pitch; from 40-100 feet, the incline is a 4-12 pitch.)

Work is force multiplied by distance.

Effort: The flume, pulley and rope are used to reduce the effort required to pull the boat back up the hill. The slope takes much of the weight off the load.

Motion: A body in motion tends to stay in the same direction and speed unless acted by some outside force (air on wind, water current, rope pull, friction)

Outside Forces: As the boat hits the water, the current of the Antietam Creek pulls the boat downstream. Gravity, the water current, friction, the weight of the boat and the riders, all need to be overcome in order to pull the boat up the flume (incline) to the top of the hill.

Power: The boat is attached to a winch by a rope. The rope turns around a drum which is powered by a 26 horsepower tractor. The wheel is fixed to the axle and together they transmit the increased force, and the boat moves up the flume.

Safety Features:

- Seat belts keep passengers in place in case of emergency stopping.
- Padded seats cushion the ride of the passengers.
- Hoisting rope with ultraviolet inhibitor has a tensile strength of 14,000 pounds; it is checked daily for frays and defects.
- The operator located at the bottom of the flume checks for water traffic and passenger safety in the creek.
- A flotation device in the boat prevents it from sinking.
- A brake on the tractor will stop the boat in case of an emergency.
- Life jackets keep passengers afloat if the boat sinks.

Specifications:

- Boat weighs approximately 400 pounds, 8'2" long, 3' 9.5" wide, 9.75" deep on the inside
- Slide bed: 43 1/2 inches wide, 100 feet + 10' flap, 16" deep on the inside, 18.5" deep on the outside, 40' has a 6-12 pitch, and 60' has a 4-12 pitch, 35.5' high
- The creek is approximately 80 feet wide.
- Tractor is 26 horsepower. One horsepower is equal to 550 ft.- lb. per second

HISTORY

1980: The idea for the boat slide is conceived; construction began by hand on the flume.

1991: The boat slide was completed. Owner Bob Rotz--with the help of his father and uncle--designed and constructed the slide.

1993: The final inspection was approved by Mr. James D. Whiteman (Safety Inspector) of Richmond, Virginia.

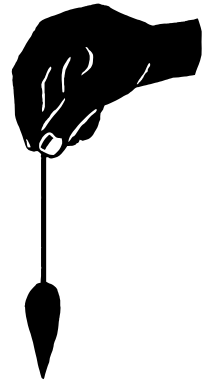
1996: A metal boat replaced the original wooden craft.

NOTES: If you want to get wet increase the load (4 heavy people). If you do not want to get wet lessen the load (2 light people.) The speed is also dependent on the weight. If the speed is constant, the velocity (distance, time and direction) is constant because it is traveling in a straight line.

ROPE SWING

What scientific principles are working at the ROPE SWING?

Pendulum: The Rope Swing is a simple Pendulum, a free-swinging object attached at a fixed point. Potential Energy(PE) at the starting platform is converted to Kinetic Energy (KE) as you swing out, then back to PE at the other end of the arc. The KE is highest (and you will swing the fastest) at the low point of the arc (where you are the nearest to the water.) This conversion from PE to KE back to PE continues as you swing back and forth on the rope swing.



Period: The time to swing from one end to the other and back again is the period of the pendulum. The Period (T) of this rope swing pendulum is determined by the length (L) of the rope and the earth gravity (G). The longer the rope, the greater the period, the stronger the gravity the shorter the period. Each period is exactly the same except for the affects of friction (at the top of rope it rubs against the tree and the air resistance against your body.) The effects of air friction are minimal.

- Experiment-release an empty seat and count the seconds it takes to complete a period. Now have a student sit on the seat and count the seconds it takes to complete a period. Try the same experiment with the rope swing at the badminton court (it is much shorter)

Specifications:

$$T = 2\pi\sqrt{\frac{\ell}{g}}$$

- This rope swing pendulum has a length of 18.3 M.
- The gravity is 9.8 meter per sec
- To figure the period of the rope swing pendulum, first multiply 2 times π (3.14). Then multiply this answer time the square root of 18.3 divided by 9.8. (See the formula at left.) The answer is 8.6 seconds.

Statistics and Safety Features:

- The weight of the load on the rope is distributed over two supports.
- Tensile strength of rope is 6500 pounds.
- The rope hooks onto the harness to prevent slipping.
- A helmet is worn to protect the head.
- The rope is 1.6 centimeters (5/8 inches) thick, and approximately 18.3 meters (60 feet) long.

CABLE RIDE

What scientific principles are working at the CABLE?

Potential Energy: The axle of the pulley allows the wheel to turn freely as the cable runs over it to reduce the friction between the load and the pulley.

Gravity: The force of gravity starts the movement from the platform. The inclined plane increases the velocity. The pulley reduces friction. The weight of the person will increase the speed and distance traveled. Landing on the ramp makes for an easy landing and reduces the effort to lift the person.

Statistics:

- Designed in 1979.
- Oldest rider: 87 years old
- Youngest rider: 9 months old

Goal:

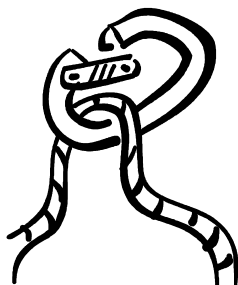
- Push off the platform
- Rotate hips to keep a forward motion
- Place feet down and land on the feet
- Run along the ground until you stop

Safety Features:

- Harness worn
- Aircraft cable line has 1400 lb. tensile strength
- The cables have been installed at different specified heights and distances to work effectively
- It is importance that there will be sufficient starting energy to prevent from being “stuck,” in the middle of the ride.

Specification:

- Length 300'
- Height-Varies



EXPLORE MORE!

Science is all around us. The following scientific principles are all demonstrated through the activities of Antietam Recreation.

Centripetal Force
Friction
Potential and Kinetic Energy
Displacement (Archimedes Principle)
Gravity
Newton's Laws of Motion
Pendulum
Acceleration
Power
Force
Speed

Consider these activities and see which principles you can identify:

- Barge
- Boat Slide
- Burma Bridge
- Cable Ride
- Canoeing and Kayaking
- Carousel Ride
- Downhill Slide
- Horse Ring Ride (bit and reins)
- Mud Pit Rope Swing
- Rope Swing at dock
- Swings
- Swinging Bridge
- Trick Roping

