

Sandy Spring Museum
Machines and Motion Learning Packet
Grade 5



Hours:

Monday | Wednesday | Thursday - 9:00am to 4:00pm
Saturday | Sunday - 12:00pm - 4:00pm
Tuesday | Friday – Closed

**“Machines & Motion” school field trip available:
Mondays, Thursdays and Fridays**

17901 Bentley Road
Sandy Spring, Maryland 20860

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www.sandyspringmuseum.org

Introduction

Thank you for deciding to visit Sandy Spring Museum for your field trip! We hope that your students enjoy learning about their local history and environment. In this packet you will find an outline of your visit along with our educational objectives, themes, a brief history of the Sandy Spring area, a timeline, activities and worksheets. Feel free to use these before and/or after your visit to the site to enrich and reinforce the concepts your students learn here at the museum. We welcome you to adapt these materials and make copies!

Directions:

From Rockville:

1. Take Rt 28 East to the intersection with Georgia Avenue (Rt 97)
2. Turn left and drive north for approx 3 miles
3. At the intersection of Rt 97 and Rt 108 (Olney) turn right
4. Proceed East until you enter the village of Sandy Spring (landmarks: Fire Station, Post office and Sandy Spring National Bank)
5. From the village the museum is about 3 blocks away. Look for a Lowest Price gas station on the left. (This is where Bentley Road intersects with Rt 108)
6. Turn left on Bentley Rd and then turn right into museum's driveway

From Bethesda:

1. Go North on either Georgia Ave or Conn. Ave to Georgia Ave.
2. Proceed north on Georgia (Rt 97) and follow the directions above

From Washington, D.C.:

1. Take 16th Street north to Georgia Avenue
2. Proceed north on Georgia (Rt 97) and follow the directions above

From Silver Spring:

1. Take New Hampshire Avenue (Rt 650) north until you reach the intersection of Rt 650 and Rt 108 (community of Ashton)
2. Turn left on to Rt 108
3. After you pass Sherwood High School on your left, watch for the museum on your right.
4. Turn right on Bentley Road (at the Amoco station) and then right into the museum's driveway.

Your Field Trip to Sandy Spring Museum

Your tour of Sandy Spring Museum is and will take about 90 minutes to complete. Your students will split into three groups and rotate through three Learning Centers for about 25 minutes each.

In the Museum students will tour our gallery and discover how producers provided goods and services to the Sandy Spring community (5.1.5.3). Students will learn how taxes financed some of Sandy Spring's public services (5.6.5.1). Students will describe the motion of a piece of 19th century kitchen technology using distance traveled, time, and speed (5.5.A.1)

In the Blacksmith's Shop students will see how the blacksmith acts as a producer in his community and provides goods and services to satisfy economic wants (5.5.1.3). Students will explore how changes in technology have impacted the economy and see how specialized work results in trade, interdependence, and economic growth (5.4.5.4, 5.7.5.2). Students will also learn about the role that different types of motion, friction, gravity, and energy (kinetic and potential) play in the forge (5.5.A.1, 5.5.A.2, 5.5.A.4).

In the Barn students will identify simple machines and discover how they were used to adapt and modify the natural environment of Sandy Spring through the Civil War time period (5.4.4.1). Students will also discover how changes in farm technology impacted the Sandy Spring economy (5.4.5.4). Students will be able to use and identify different types of simple and complex machines and describe the motion they make and the types of energy they use (5.5.A.1, 5.5.A.4).

Bonus:

If your group has another 30 minutes to spend at the museum you may add the option of seeing a live spinner demonstrate the production process of yarn-making. This option depends on the availability of our spinner so if you are interested in adding (or swapping the spinner for the blacksmith) inquire with our Education Director.

Educational Objectives (Montgomery County Public Schools)

History and Social Science:

Geography

5.4.4.1

- a) Identify ways and reasons why people in the US through the Civil War era adapted to and modified their natural environment with technology, and analyze the consequences of the modifications

Economics

5.1.5.3

- a) Explain how producers combine resources to provide goods and services to satisfy economic wants

5.4.5.4

- a) Explain how changes in technology (factories, machinery, transportation, communication, new technology) have impacted the developing U.S. economy now and in the past

5.6.5.1

- a) Explain how taxes finance government operations and provide public goods and services

5.7.5.2

- a) Explain how specialized work results in interdependence, trade, and economic growth now and in early U.S. history

Science

Standard 5: Physics – Mechanics

5.5. A.1 Describe the motion of objects using distance traveled, time, direction, and speed.

- a. Observe, describe, and compare types of motion.

- b. Use measurements to describe the distance traveled as the change in position.
 - c. Based on data describe speed as the distance traveled per unit of time.
- 5.5. A.2 Explain that the changes in the motion of objects are determined by the mass of an object and the amount (size) of the force applied to it.
- a. Observe and give examples that show changes in speed or direction of motion are caused by an interaction of forces acting on an object
 - b. Observe and explain the changes in selected motion patterns using the relationship between force and mass.
- 5.5. A.4 Cite evidence that energy in various forms exists in mechanical systems.
- a. Identify ways of storing energy (potential) in an object.
 - b. Identify that an object has energy (kinetic) related to its motion.
 - c. Observe and cite examples showing that stored energy may be converted to energy of motion and vice versa.

A Brief History of the Sandy Spring Community

This community encompasses a six mile radius with the Sandy Spring Friends Meeting House as the center of the community. This area was founded by wealthy English settlers, many of whom were Quaker. James Brooke, a converted Quaker, was the first to settle in Sandy Spring in 1728.

They came to this area to farm. The land was mainly forests and needed to be cleared in order to allow enough land to plant their crops. The main crop planted in this early community was tobacco.

Quakers

The Society of Friends or Quakers were simple people who came to America in search of religious freedom. They wore plain clothes, were strongly in favor of education, and were against violence and war. As the population of this area increased, the Quakers built a Meeting House near a sandy spring. The area received its name from this spring. The Sandy Spring Meeting House and the “Sandy Spring” still exists today.

Agriculture

Washington, D.C. and Baltimore were the markets for crops grown in this area. Goods taken to market that were produced on the farm were tobacco, vegetables, orchard crops, and dairy products.

Milling

After farming, milling was the community’s largest industry. Many farms had their own mills to grind grain and corn into flour or meal. Mills were also used to saw lumber, process wool and cotton, press oil from flax seed, and grind bones to use in fertilizer.

General Store

Small general (also called country) stores were needed to provide farming families with supplies that they could not produce on the farm. General stores were also gathering places for neighbors to discuss farming information, exchange news, and discuss the weather.

Post Office

Mail was brought by horseback to the post office boxes which were located in the home of Postmaster, Edward Stabler and the residents would come to the back porch for their mail. At the time of his death in 1883, Edward Stabler was the oldest and longest serving Postmaster in the United States.

Forge

The blacksmith and the wheelwright were important producers in the community. The blacksmith and the wheelwright worked in a shop where they made and repaired farming tools and wheels. The oldest continuing business in Olney is Finneyfrocks whose blacksmith shop was started in 1885.

Schools & Education

The first school in the Sandy Spring area was a one-room log building built in 1797. It remained in operation for 99 years. Most children walked to school or came on horseback. The Sandy Spring School was built on Meeting House Road and taught not only children of the community but also children from distant counties and other states. A child's early education made use of a hornbook which was used to teach letters and numbers. Slate and slate pencils were used instead of paper and pencil.

Lunches were brought to school by the students in boxes or pails. It was also not unusual for the teacher to provide soup, sandwiches, cider, or popcorn for his or her students. Recess included many games still played today such as baseball, jump rope, and tag.

By the late 19th century there were a least seven schools in the area. African-American children went to different schools than white children.

The Free African-American Community

In 1790, the Society of Friends took action against slave owning Quakers. They outlawed slavery among their community and the Quakers of Sandy Spring freed their slaves long before the Civil War. These freed African-Americans were able to purchase land for farming.

In 1850, 309 free African-Americans lived in the community. They were loyal to the Union during the Civil War as was much of the Quaker community. It was suspected by the Confederacy that Quakers and free African-Americans in Sandy Spring were conductors on the Underground Railroad, which provided a route North for escaped slaves from the South. After the Civil War, other newly freed slaves were attracted to the area and by 1900 there were 1,000 African-American living as farmers in the Sandy Spring area.

Life as a Child

Children usually played with their brothers and sisters and sometimes nearby neighbors. There wasn't much time for play because children were expected to help with the chores on the farm. It was common for children to help with chores before school in the morning. Boys and girls often were responsible for different chores. Girls learned to make soap and candle, weave cloth, sew, embroider, cook, and clean. Boys learned to use farming tools and how to handle and care for farm animals. Hunting and fishing were done by boys.

At harvest time everyone on the farm had extra work to do. The children would help bring in the hay. The end of the harvest was celebrated with fried chicken and home-made ice cream.

Entertainment

Reading was a popular past time before electricity was invented. "Dime novels" were paperback books of short stories about pirates, Indians, and soldiers. Children's toys included yo-yos, Jacob's ladders, tops, and hoops. Baseball was a popular sport and a Sandy Spring man named Jack Bentley played for the New York Giants in 1924. Jack's family donated the land for the Sandy Spring Museum.

Sandy Spring Museum Timeline

1634 Landing of the Arc and Dove; founding of the Colony of Maryland

1695 Establishment of Prince Georges County (includes future Montgomery County and Sandy Spring).

1728 James and Deborah Snowden Brooke become the first settlers of Quaker Sandy Spring

1745 Friends begin conducting their Meetings near the spring that will give the community its name.

1758 Anglican petitioners establish a Chapel of Ease at Brighton, Sandy Spring's earliest formal house of worship

1776 Declaration of Independence; Montgomery County formed

1777 Baltimore Yearly Meeting bans Quaker buying and selling of slaves

1781 Quaker Monthly Meeting imposes "disownment" banishment from Meetings of Friends still holding slaves

1783 Treaty of Paris ends the Revolution and recognizes the United States

1803 Thomas Moore patents refrigerator (a name he also invented)

1804 President Jefferson appoints Isaac Briggs Surveyor General of Louisiana Purchase

1806 Thomas Moore becomes Chief Engineer for C&O Canal and National Road west.

1814 President Madison, fleeing invading British in War of 1812, spends night at home of Caleb and Henrietta Bentley in Brookeville

1816 Using brick fired on the site, Friends erect a Meeting House, the county's largest church at the time; Sandy Spring Post Office established at Harewood, James P. Stabler postmaster

1819 Caleb Bentley and James P. Stabler open general store at site of today's Sandy Spring Store

1828 Philip Thomas becomes founding president of the B&O Railroad, the nation's first

1842 Subscription library formed at Sandy Spring

1845 Elizabeth Ellicott Lea publishes her celebrated cook book

1848 Mutual Fire Insurance Company of Montgomery County opens in Sandy Spring

1849 Pannings along stream on Brooke Meadow farm trigger Sandy Spring's largest gold strike and give name to road

1850's Families assist slaves escaping via the Underground Railroad

1863 U. S. Emancipation Proclamation becomes law

1864 Confederate troops rob Sandy Spring Store; a posse of locals(including many Quakers) sets out in pursuit, engages the rebels near Rockville in a skirmish known as Battle of Ricketts Run, kills the leader, and recovers stolen goods

1868 Savings Institution of Sandy Spring founded

1873 Montgomery Farmers' Club founded; Joseph T. Moore establishes Olney Grange

1900 First National Bank of Sandy Spring created as mortgage arm of Savings Institution; Annals record first automobile observed in neighborhood

1920 Montgomery County Hospital opens; Women win right to vote, due in part to suffrage efforts of Sandy Springers Mary Bentley Thomas and Caroline Hallowell Miller

1923 Local baseball great Jack Bentley signs with New York Giants

1924 Sandy Spring Volunteer Fire Department organizes as fourth unit in county

1926 Clara May Downey opens the Olney Inn with three tables seating 12 diners

1930 Strength of bank during Depression helps protect local farmers from loss of farms

c.1940 Headwaters, Olney home of Secretary of Interior Harold Ickes, becomes the frequent poker retreat of President Franklin Roosevelt

1942 Annals record flurry of World War II activities: plane spotting, sewings and preparation of surgical dressings, heightened fire protection, war bond promotions, bundles for Britain and the Red Cross, rationing of tires, gasoline, and food, and scrap metal drives

1957 Integration begins at Sherwood, four black students enroll

1961 Sandy Spring Friends School founded by S. Brook Moore

1972 First National Bank and Savings Institution combine as Sandy Spring National Bank and Savings Institution

1980 Sandy Spring Museum founded

Machines and Motion at Sandy Spring Museum

Directions: Unscramble each of the clue words.

Copy the letters in the numbered cells to other cells with the same number.

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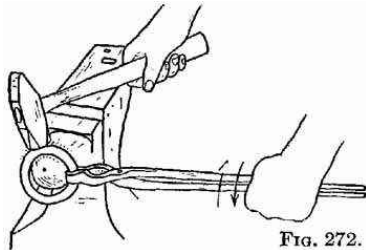
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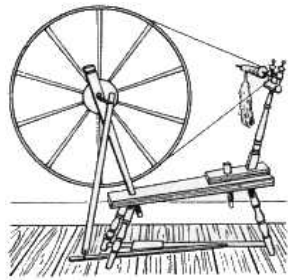
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Simple Machines at Sandy Spring Museum

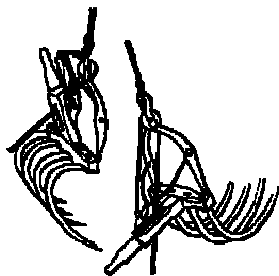
The Sandy Spring Museum showcases many simple machines that aided Sandy Spring farmers, blacksmiths, spinners, and homemakers.



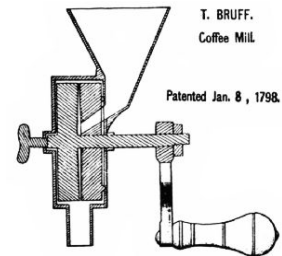
A **lever** is used to move objects around a pivot. A blacksmith's hammer increases the force that can be used to shape metal in the forge.



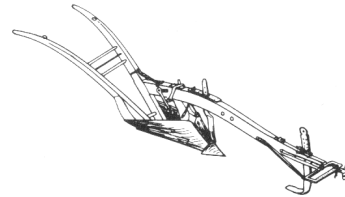
A **wheel and axle** is used to move things from place to place. A spinners' wheel is used to make thread from natural fibers.



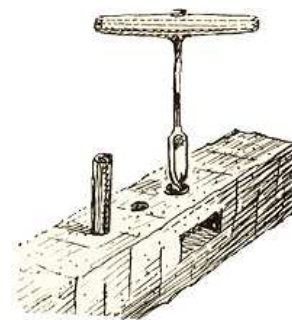
A **pulley** is used to move a load up, down, or sideways. Pulleys are used to lift horse hay forks which are used to load hay into a barn shaft.



An **inclined plane** controls the speed or direction of an object moving from a higher place to a lower place. A coffee mill funnels coffee beans into a grinder to make coffee grounds.



A **wedge** is used to push two things apart. A plough is used to cut furrows into the ground to turn up nutritious soil and make a groove to plant seeds in.



A **screw** is used to raise or lower something or keep it together. An auger is a tool that drills holes into wood by raising wood shavings out the hole as it drills.

Motion at Sandy Spring Museum

Motion: the process of changing position or moving

Type of Motion	Definition	Examples
Uniform	Equal distances traveled in equal times.	<ul style="list-style-type: none">• Conveyor belts• Escalators
Variable	Different distances traveled in equal times.	<ul style="list-style-type: none">• Car accelerating• Object falling
Periodic	Motion that repeats itself.	<ul style="list-style-type: none">• Swing• Pogo stick

Vocabulary List

Anvil. A heavy iron block on which the blacksmith hammered iron to make tools.

Apprentice. A person who learns a trade by living with the family of a skilled worker and training for several years.

Blacksmith. A person who makes farming tools, household items and other things from iron.

Capital resources. Goods made by people and used to produce other goods or services.

Community. A group of people with common interests, especially those living in the same area.

Craft. An occupation requiring manual or mechanical skill to make or produce goods with care.

Forge. A large, open fireplace used by a blacksmith to heat iron.

General (Country) store. A shop, usually found in a small community that carries a variety of goods including food, tools, medicines and other household necessities that could not be made on a farm. They usually meeting places for neighbors to exchange news and gossip.

Human resources. People doing physical or mental work to produce goods or services.

Inclined Plane. A ramp that makes it possible to climb gradually or control the speed or direction of descent.

Lever. A stiff bar that turns on a fixed point known as a fulcrum.

Quaker. People who call themselves the Society of Friends and believe in living a simple life, being educated, never fighting, and not holding slaves. Sandy Spring was founded by a Quaker man names James Brooke in 1728.

Meeting House. a building used by Quakers to worship by meeting together.

Miller. The person who operates the mill.

Motion. The process of changing position or moving.

Uniform. Equal distances traveled in equal times.

Periodic. Motion that repeats itself.

Variable. Different distances traveled in equal times.

Natural resources. Gifts of nature that can be used to produce goods and services.

Producers. People who combine natural, capital, and human resources to make goods and/or services.

Pulley. A tool that gives no increase of force, but changes direction. Pulling down with this tool raises or moves the object.

Region. An area that has one or more geographic characteristics in common. Maryland is part of the Mid-Atlantic region of the United States.

Resources. Things that can be used to produce a good or service.

Screw. An inclined plane wrapped around a round form.

Spinner. A person who uses a spinning wheel to make thread or yarn out of wool or flax.

Spinning Wheel. a device used for spinning wool and flax into yarn or thread. It was made of a single spindle driven by a large wheel operated by hand or foot.

Spring. A body of water from the earth that looks like a small stream or or small lake.

Smithy. A blacksmith's workshop.

Tobacco. An important crop grown all over Maryland that is used to make cigarettes and is smoked in pipes.

Trade. The exchange of resources, goods, or services through barter or the use of money.

Wedge. Two inclined planes, back to back, whose sloping surface makes the job a more gradual one.

Wheel & Axle. A lever that spins in a circle and lessens the force needed to lift or move a weight.

Wheelwright. A person who makes and repairs wheels.

Wool. the soft, curly hair that comes from the fleece of sheep.