



# LOWER SCHOOL FOR GIRLS

SPRINGSIDE CHESTNUT HILL ACADEMY

## CURRICULUM GUIDE

Pre-Kindergarten-4th Grade



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# ART

## PHILOSOPHY:

The heart of the art program is the making of art, which allows students to be artists and experience the frustrations, risks, and joys of the creative process. It gives students a sense of making discoveries, achieving something original, and pride of ownership.

## GOALS:

- To stimulate visual awareness.
- To develop the ability to look and talk with comfort about what one sees.
- To develop intellectual and emotional responses to one's environment.
- To communicate ideas, spirit, and feeling in visual form.
- To encourage experimentation and risk taking with materials, concepts, and techniques.
- To know art as personal discovery through original thinking and self-expression.
- To promote a sense of responsibility and respect for the unique capabilities of self and others.
- To create a broad base of understanding about artists and works of art in past and contemporary times and its contribution to our understanding of history.
- To make students aware of the connection between art and other disciplines.

## METHODS:

- Teacher demonstration of tools, materials, or techniques.
- Group brainstorming to expand project ideas.
- Hands-on design and construction with two- and three-dimensional materials.
- Assigned projects—individual and group.
- Independent projects—individual and group.
- Maintaining personal sketchbooks (1st through 4th grades).
- Art folders (3rd and 4th grades) for written project evaluation.
- Studies in the Wissahickon and on school grounds.
- Viewing and discussing displays of student artwork.
- Interdisciplinary study with homeroom or other special classes.
- Discussing professional art exhibitions here at SCH Academy.

- Visiting artists with slides or original art to talk with classes.

## Pre-Kindergarten

Pre-Kindergarten children are immersed in art activities throughout the day. In the classroom, they are surrounded by materials for use in directed and free-choice art activities. Students in grades K–4 attend art classes in a spacious studio designed to facilitate traditional art and new media studies, and to enhance sculptural possibilities through the opportunity to work with tools in the woodshop. Individual and collaborative expression is developed across content areas using techniques such as drawing, painting, printmaking, sculpture, ceramics, and fiber arts.

## EXAMPLES OF ART EXPERIENCES:

### Kindergarten–Second Grade:

- *Drawing:* Develop the use of pencil, marker, oil pastel, and chalk pastel to evolve technique; explore pattern, scale, and composition; represent images from imagination and observation. Projects include self-portraits, still-life drawing, fact and fiction fish, Whingdingdillies, reflective patterns, and the development of a personal sketchbook.
- *Painting:* Develop the use of watercolor, tempera, and acrylic paint and create a routine for painting; learn the difference between media; distinguish use of different brushes; develop painting techniques; learn beginning principles of color theory; learn to mix color in a palette; represent images from imagination and observation. Projects include portraiture,



- still life, landscape, pattern and design, tints and shades, secondary colors.
- *Sculpture*: The use of red and white clay to develop ceramic skills; learn the process of glazing and firing; use of mixed media to brainstorm, plan, problem solve, and execute ideas. Examples include celadon-glazed Chinese zodiac animal and dragon plate, animals in their habitat, owls, and leaf plate.
- *Woodshop*: Learn the use of basic tools such as the hammer, saw, pliers, drill, and vice for use in projects ranging from low-relief to freestanding sculpture; woodshop safety. Projects include day and night sculpture, wooden animals, and rattle.
- *Art History*: The study of Africa and Japan informs students' appreciation of other cultures and expands their repertoire of materials and techniques. Projects include making a spirit necklace, calabash, Kente cloth-inspired printed cloth, Sumi-e painting, gyotaku prints, and the production of a Japanese fan.
- *Artists*: The study of famous artists helps students appreciate the evolution of art through history, the individual contributions of the artist to an art movement, and the interplay of culture and art. Examples include Faith Ringgold, Grandma Moses, Vincent Van Gogh, and Georgia O'Keeffe.
- *Art Criticism*: The ability to evaluate art begins with verbal suggestions from the teacher intended to stretch students' thinking and production. Individual evaluations evolve into a group critique held by the teacher who summarizes strengths and suggests new directions. In time, the group critique held by the teacher becomes a student critique in which students identify similarities and differences in classmates' work, verbalize what impresses them about a work, and give suggestions for new direction.

### Third and Fourth Grades:

- *Drawing*: Develop the use of pencil, marker, oil pastel, chalk pastel, and charcoal to evolve technique; explore pattern, scale, composition, shading, viewpoint, and perspective; represent images from imagination and observation. Projects include self-portraits, still-life drawing, chiaroscuro, one- and two-point perspective, gesture, and contour line drawing.

- *Painting*: Develop the use of watercolor, tempera, and acrylic paint and create a routine for painting; represent images from imagination and observation; use color and imagery to express oneself and evoke a response; learn more complex principles of color theory. Projects include portraiture, still life, landscape, pattern and design, tints and shades, warm and cool colors, secondary colors, intermediate colors, color theory book, contour line self-portrait.
- *Sculpture*: The use of red and white clay to develop ceramic skills; learn the process of glazing and firing; use of mixed media to brainstorm, plan, problem solve, and execute ideas. Projects include Marisol sculpture, personified fruit or vegetable, or Louise Nevelson sculpture.
- *Woodshop*: Develop skills with basic tools such as the hammer, saw, pliers, vice, anvil, T-square, drill, and rasp for use in projects ranging from low-relief to freestanding sculpture; woodshop safety. Projects include wood puzzles with drawstring bags, frames, jewelry, and marionettes.
- *Art History*: The study of Egypt and the Maya civilization informs students' appreciation of other cultures and expands their repertoire of materials and techniques. Projects include amulet, miniature sarcophagus, painting of Egyptian god or scene on papyrus, faience animal, trip to the University of Pennsylvania museum, research of rainforest animals in Central America, Mayan headdress, and interdisciplinary rainforest performance.
- *Artists*: The study of famous artists helps students appreciate the evolution of art through history, the individual contributions of the artist to an art movement, and the interplay between culture and art. Examples include Marisol, Pablo Picasso, Romare Bearden, Alexander Calder, and yearly visiting book artist.
- *Art Criticism*: The ability to evaluate art and think critically; the ability to take criticism and assess work in progress; individual critique, group critique, written critiques kept in personal art folder.



## CENTER FOR ENTREPRENEURIAL LEADERSHIP (CEL)

- All Lower School students have the opportunity to join our Lower School New Media teacher to participate in a unique CEL project. They channel their creativity and curiosity to solve real-world problems for others, including peers, school leaders, and even animals. Through these design-thinking experiences, they learn to see problems as opportunities to create solutions. In order to design their solution, students interact and empathize with the users who experience that problem. Innovative solutions emerge from a combination of teamwork, financial literacy, communication, and technology.

### METHODS:

- *Teamwork:* Students work collaboratively in small teams and as a class to interview community members, share ideas, ask questions of experts, and conduct research. Using this new information, they brainstorm possible solutions and decide together what idea they will try first.
- *Communication:* Students practice effective communication of their ideas using technology, writing, and most importantly, their own voices. In sharing progress with others in the community, they receive feedback and new ideas that can potentially inform the next version of the solution. Throughout the entire design process, students practice interpersonal communication and relationship building with their teammates and mentors.
- *Technology:* Throughout the projects, students transform their concepts into creations. Expert mentors work with the students to use audio-recording and film-editing software, electronic circuits, and even advanced machinery such as laser cutters and 3D printers. These learning opportunities often inspire students to think creatively about how to use technology to solve problems outside of the classroom, while also preparing them for the skills-based CEL classes in Middle School.



### LEARNING OUTCOMES:

- *Empathy:* Students demonstrate the ability to listen to others as they share and learn how to respond appropriately.
- *Creative Problem Solving:* Students can engage in discussions in order to attempt to identify a user's needs.
- *Teamwork and Collaboration:* Students engage in discussions on ways to give and receive positive comments as well as to have meaningful and constructive conversations about project failures.
- *Communication:* Students demonstrate an ability to generate and ask questions as well as to engage in conversations about failures and will participate in giving and receiving positive comments.
- *Technology:* Students learn how to use technology to enhance their ideas.
- *Finance and the Use of Data:* Students will begin to collect data through interviews and questions. Older students are introduced to the basics of finance, including supply and demand, deposits, withdrawal, interest, balance, budget, profit, and loans.

# LANGUAGE ARTS

## PHILOSOPHY:

"Language is the most powerful, most readily available tool we have for representing the world to ourselves and ourselves to the world. Language is not only a means of communication, it is a primary instrument of thought, a defining feature of culture, and an unmistakable mark of personal identity."

~ National Council of English & International Reading Association

## GOALS:

- To nurture joy and skill in reading and writing and build confidence in each student's ability to express ideas orally and in writing through an immersion in children's literature (fiction and nonfiction), the writing process, and explicit skill development.
- To develop the skill of listening.
- To connect reading, writing, speaking, and listening to the students' own experiences.
- To integrate language arts in all subject areas.
- To develop students with multiple literacies, able to use technology and digital media effectively.
- To infuse rigor through increasingly complex language arts tasks as students progress through the Lower School for Girls.

## METHODS:

- Informed by research, our language arts program teaches students to be flexible, fluent, and precise readers and writers.
- The Heggerty phonological awareness program is used in PreK-1st grade to explicitly teach students how to manipulate sounds within words, a critical foundational reading skill.
- Foundations, a systematic, sequential phonics program is used in Pre-K-3rd grade to teach letters, letter sounds, handwriting, and decoding.
- Lexia, a web-based adaptive blended learning program, is used in Pre-K-2nd grade to reinforce a variety of critical pre-reading and reading skills.
- Exposure to a wide range of literature at school and at home promotes understanding of story structure, plot development, vocabulary development, and the wider world.



- The Units of Study for Teaching Reading from the Teachers College Reading and Writing Project support the classroom reading instruction.
- Reading is individualized for each child and assessed regularly by the classroom teacher and/or reading specialist using a variety of assessment measures, including the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), the Fountas and Pinnell Benchmark Level Assessment, and other standardized measures. Assessment results help teachers plan all areas of reading instruction.

## EXAMPLES OF LANGUAGE ARTS EXPERIENCES:

### Pre-Kindergarten and Kindergarten:

- Listening and responding to folktales, poetry, nonfiction, and fiction
- Journals, dictionaries, bookmaking, newsletters
- Building a phonetic foundation through rhyme, letter and sound identification, printing of letters and words, sounding out words
- Storytelling, poetry, word games, and retelling stories through drama
- Dictating and illustrating newsletters
- Grammar
- Handwriting
- Building a foundation of sight words
- Generating questions
- Writing and drawing responses to experiences
- List making
- Labeling
- Reading decodable texts





- Reading sight word books and books with predictable patterns
- Technology: software that supports language arts skills such as Lexia
- Phonetic writing
- Book baskets
- Sight words

#### **First and Second Grades:**

- Listening to, reading, and responding to a variety of literature
- Daily reading based on word patterns, sight vocabulary, context clues, phonics, and language experiences
- Writing in multiple genres
- Sentence construction, capitalization, and punctuation
- Spelling based on word study, phonetic skills,

and most frequently used words

- Vocabulary development in context
- Manuscript handwriting practice
- Drama and public speaking: formal and informal
- Research projects
- Technology to support all language skills

#### **Third and Fourth Grades:**

- Individualized reading within guidelines set by teacher, librarian, and reading specialist: multiple genres
- Paired and small group reading of novels emphasizing summary, vocabulary, prediction, inference, plot, character development, point of view, and setting
- Listening and responding to a variety of literature
- Daily silent reading
- Research to acquire information
- Reading nonfiction books and keeping a journal of important facts/questions/connections
- Writing in multiple genres
- Paragraph construction
- Advanced word study
- Learning and using proper grammar, correct spelling, and writing conventions
- Proofreading, editing, and revising
- Cursive handwriting practice
- Vocabulary development
- Dictionary and reference materials
- Drama and public speaking, formal and informal
- Technology to support all language art skills



## LIBRARY

### PHILOSOPHY:

- To empower students to develop into critical thinkers and lifelong learners.
- To promote literacy development and foster lifelong reading.
- To guide children to see themselves as readers, and to identify their preferences and strengths as readers and learners.
- To collaborate with teachers to help students become competent, critical, and ethical users and finders of information and independent reading—both at SCH and in the wider world.
- To provide each community member with a venue for exploring questions that arise out of personal curiosity/interest.
- To maintain open access to a diverse, balanced collection of resources in a variety of formats to meet information, curricular, and independent reading needs of the SCH community.

### EXAMPLES OF LIBRARY EXPERIENCES:

#### Pre-Kindergarten and Kindergarten:

- Read-alouds: introduction to a variety of genres.
- Identify title, author, and illustrator.
- Begin to distinguish differences between fiction and nonfiction.
- Learn how to take care of books.
- Introduce the library as a place to find information and stories.
- Begin to learn how to safely use iPads and balance screen time.

#### First Grade:

- Read-alouds: continued exploration of genres, with a focus on biographies and folk tales.
- Identify fiction and nonfiction texts.
- Begin to use age-appropriate digital resources for research and pleasure reading.
- Navigate different sections of the library.
- Locate books on library shelves.
- Learn to use the text features of books to find information.
- Guided practice for keeping safe online.

#### Second Grade:

- Ability to select just-right books.
- Conduct research and learn how to determine fact or fiction.



- Find information and learn how to credit sources.
- Practice sharing books with others via discussion and digital media.
- Continue development of critical thinking skills in evaluating books.
- Practice finding student friendly, reliable sources of online information.

#### Third Grade:

- Conduct book exchange and book talks using a variety of genres.
- Search OPAC and locate books on shelves.
- Use online databases to conduct digital research.
- Paraphrase, quote, and give credit to sources of information.
- Display an understanding of the Dewey Decimal system.
- Identify title, author, copyright, index, and parts of print and e-books.
- Use simple bibliography.

#### Fourth Grade:

- Conduct book talks by genre.
- Perform basic research on topics using prescribed search engines and databases.
- Evaluate websites for reliability and bias.
- Identify and cite appropriate resources.
- Create bibliography with Noodletools.
- Maintain privacy and security online and understand the concept of a digital footprint.



# MANDARIN CHINESE

## PHILOSOPHY:

"Language and communication are at the heart of the human experience. The United States must educate students who are linguistically and culturally equipped to communicate successfully in a pluralistic American society and abroad."

The Standards Task Force identifies five goal areas: Communication, Culture, Connections, Comparisons, and Communities

~ *National Standards for Foreign Language Education*

## GOALS:

- To introduce the students to a variety of aspects of the Chinese language.
- To explore a variety of components of Chinese culture.
- To strengthen global awareness.
- To have students build their ability to compare languages and cultures.
- To make connections between their communities and Chinese communities.
- To make Chinese relevant to the students' everyday lives.
- To learn the sound system of the language, learn to gradually recognize an expanding group of Chinese characters, and start to construct simple sentences.
- To begin listening, speaking, reading, and recognizing high frequency words.
- To learn to read Chinese sentences and write characters.
- To develop the students' basic Chinese vocabulary dealing with family, animals, friends, and other topics aligned with their thematic studies.

## METHODS:

- Study of Chinese culture is interdisciplinary and encompasses art, music, literature, geography, and food.
- Chinese culture is brought to life, enabling each child to gain a thorough and genuine understanding.
- Exploration of picture books, character books, songs, games, writing, art projects, and speaking practice facilitates language acquisition and cultural literacy.

## CONTENT:

- *Third Grade:* Chinese in third grade moves through the first half of the second volume of the My First Chinese Reader textbook. Students develop a better understanding of how Chinese vocabulary, grammar, and sentence structures can be harnessed and used to create original conversation. They are encouraged to explore the fun and excitement of developing basic dexterity with a new language through an extensive supplemental program of activities, games, and cultural projects.
- *Fourth Grade:* Fourth graders complete the second half of the second volume of the My First Chinese Reader textbook. They improve their ability to ask questions of others and discuss themselves and their opinions in Chinese as they study a series of chapters on shopping, language, the weather, and directions. Fourth graders begin to study Chinese characters in earnest, and they spend considerable time developing both the passive and active knowledge necessary to read and write characters.



# MATHEMATICS

## PHILOSOPHY:

"Mathematics is more than a collection of concepts and skills to be mastered; it includes methods of investigating and reasoning, means of communication, and notions of context. In addition, for each individual, mathematical power involves the development of personal self-confidence."

~ *National Council of Teachers of Mathematics*

Lower School Mathematics at SCH follows the Math in Focus curriculum (Singapore Math) and uses a four step process to expose students to mathematical thinking. The lesson structure in all grades incorporates hands-on activities and explorations to promote mastery. The same four concepts are interwoven into the program content.

- *Learn:* whole group direct instruction presents math concepts in straightforward visual format, with frequent use of manipulatives and models
- *Guided Practice:* teacher directed practice in small and large groups that allow students to check their understanding while working with some guidance
- *Let's Practice:* Independent practice consolidates learning and prepares students to be successful on homework assignments
- *On Your Own:* independent work in class or at home in student workbook

## GOALS:

- To enable students to think, reason and communicate mathematically.
- To provide different contexts for students to develop a strong sense of number and to master numerical skills.
- To emphasize the interrelationships among the curricular strands: number operations, number theory, geometry (2D and 3D), algebraic thinking, measurement (time, money, distance), and data analysis.
- To foster connections between mathematics and life experience.
- To empower all students as active learners of mathematics.
- To provide opportunities for students to discover mathematical principles.
- To provide students with a solid mathematical basis at each grade level, and lay the foundation they can

build on to become confident and comfortable mathematical thinkers.

## METHODS:

- Model concepts and skills with manipulatives.
- Problem solving that requires effective reasoning and accurate skills.
- Practice expressing mathematical ideas using the Concrete - Pictorial - Abstract progression
- Explorations: collaborative and independent.
- Lessons and discussions: whole class and small group.
- Practice with numerals, symbols, and skills.
- Daily work to practice and reinforce concepts and skills.
- Mastery and retention of basic facts, using both tradition and technology-based approaches, and application of those facts to various problem solving situations.
- IXL and ALEKS, adaptive web-based programs, are used to supplement and extend classroom work.

## Pre-Kindergarten

Pre-Kindergarten follows a program that introduces the students to Counting, Numeration, Geometric Shapes, Measurement, and Data Analysis :

- *Number Operations:* addition and subtraction; developing number stories
- *Numeration:* whole numbers comparing numbers and number sense; counting as one-to-one correspondence with objects and numbers on the number line; classification with sets and sub-sets (Venn diagrams); investigations with numbers.
- *Geometry:* the geometry of two and three dimensions with emphasis on naming shapes, discovering patterns, and investigating area and volume.
- *Measurement:* the relationship of units of time (minutes, hours, days, weeks, etc.); calendar, temperature, money, length.
- *Data Analysis:* games with dice and spinners; data collection and graphs.

Standards for Mathematical Practice in Math Education are used to define program content Kindergarten through 4th grade.

- Make sense of Problem Solving
- Reasoning
- Communication



- Connections and Structure
- Represent and Model Mathematics

### Kindergarten

- Kindergarten begins the Math in Focus curriculum, which is built around the Standards for Mathematical Practice.
- Make sense of Problem Solving
- Build skills in comparing sets, addition, and subtraction by encountering, discussing, and solving problems
- Solve real-world problems involving sorting, counting, addition, and subtraction
- Determine number sentences to fit addition and subtraction situations
- Describe methods used to solve real-world problems
- Describe why solutions make sense and are correct

### Reasoning

- Use Concrete Models to explain reasoning
- Apply counting and comparing skills in various contexts
- Use Numerals to convey information
- Investigate ideas with 2D and 3D shapes
- Investigate Measurement concepts
- Explain how to identify equal sets
- Measure using non-standard units

- Sort objects by category using attributes
- Identify patterns

### Communication

- Consolidate thinking in independent activities
- Communicate with peers, teachers and others
- Express mathematical ideas

### Connections and Structure

- Understand the connections between quantities and written numerals
- Use numbers to describe the properties of geometric shapes
- Use counting and numbers while measuring in non-standard units
- Use of the ten-frame model when counting numbers within ten
- Explore the relationships between counting, ordering, and ordinal numbers
- Solve real-world problems involving more or less and addition and subtraction
- Relate knowledge of time and calendar to everyday activities

### Represent and Model Mathematics

- Represent quantities with objects, number cubes, fingers, pictures/drawings, number cards, acting out, tallies, and numerals
- Show understanding of big, middle, small, and equal size shapes
- Describe and compare objects by position



## First Grade

- Make sense of Problem Solving
- Build skills in addition, subtraction, and measurement through problem solving
- Solve real-world problems involving addition and subtraction
- Apply problem solving strategies
- Apply and explain problem solving practice

### *Reasoning*

- Explore concepts more deeply and justify reasoning
- Use critical thinking skills to further explore mathematical ideas
- Explore transitivity by comparing lengths and weights of three different objects
- Identify and describe attributes of objects
- Interpret picture graphs, tally charts, and bar graphs
- Identify and extend growing number and repeating shape patterns
- Recognize shapes from different perspectives
- Use the commutative and associative properties and 10's and 1's to solve 2-digit addition and subtraction problems

### *Communication*

- Present, discuss, and share mathematical thinking
- Work in small groups to explore concepts
- Use the proper vocabulary to express ideas

### *Connections and Structure*

- Relate counting to addition and examine and apply the inverse: subtraction
- Understand the relationships between numbers in fact families
- Connect addition and multiplication (repeated addition)
- Recognize and apply different strategies for adding and subtraction one and two digit numbers
- Learn how place value concepts apply to regrouping in addition and subtraction

### *Represent and Model Mathematics*

- Identify describe and extend 2 and 3 dimensional shape patterns
- Identify growing and repeating patterns
- Use number bonds to represent number combinations
- Use a variety of concrete, pictorial, and symbolic models as tools to represent addition and subtraction

- Identify rules for sorting objects
- Measure and compare length
- Use positional words to represent location
- Solve problems about equal sharing and equal groups
- Represent data in picture graphs

## Second Grade

- Make sense of Problem Solving
- Build skills in addition, subtraction, multiplication, division, and measurement through problem solving
- Solve real world problems
- Apply problem solving strategies
- Apply and explain strategies used to solve problems

### *Reasoning*

- Explore concepts more deeply and explain reasoning
- Investigate mathematical concepts using critical thinking skills
- Demonstrate the inverse relationship between the size of a unit and the number of units
- Identify, describe, sort, and classify two and three dimensional shapes
- Interpret picture graphs with scales
- Identify rules for number patterns
- Identify surfaces that slide stack and roll
- Explore the inverse relationship between addition and subtraction

### *Communication*

- Present math thinking through journaling
- Discuss and share mathematical ideas with teachers and peers
- Work together in groups to solve problems
- Use mathematical vocabulary correctly

### *Connections and Structure*

- Examine the inverse relationship between addition and subtraction
- Connect geometric concepts with unit fractions
- Connect subtraction and division
- Recognize and apply different strategies for multiplication and division
- Identify how patterns can be described using numbers, operations and data displays
- Recognize the relationship between bar models, number sentences and number patterns
- Solve real world problems involving addition, subtraction, multiplication, division, measurement and data analysis



### *Represent and Model Mathematics*

- Represent multiplication by skip counting, dot paper arrays, and bar models
- Represent division as repeated subtraction
- Describe, extend and create 2-dimensional shape patterns
- Identify rules for number patterns
- Use place value models to create equivalent representations of numbers
- Use a variety of concrete, pictorial and symbolic models to represent computation
- Use customary and metric units to represent measurement
- Represent data in bar and picture graphs
- Solve real-world problems about social phenomena
- Use bar models to represent computation

### **Third Grade**

- Make sense of Problem Solving
- Build skills in addition, subtraction, multiplication, division and measurement through problem solving
- Solve real world problems
- Apply problem solving strategies
- Apply and explain strategies used to solve problems



### *Reasoning*

- Explore concepts more deeply and explain reasoning
- Investigate mathematical concepts using critical thinking skills
- Demonstrate the inverse relationship between fractions on a number line and rulers marked with halves and fourths of an inch
- Classify and identify two dimensional shapes as polygons
- Interpret picture graphs with scales
- Create and explain multiplication and division patterns
- Model, define and explain properties for multiplication
- Explore the inverse relationship between addition and subtraction
- Use estimation to check reasonableness of answers

### *Communication*

- Discuss and share mathematical ideas with teachers and peers
- Work together in groups to solve problems
- Use mathematical vocabulary correctly

### *Connections and Structure*

- Examine the inverse relationship between multiplication and division
- Understand that the size of a fraction is relative to the size of the whole
- Connect the units of customary capacity with one another
- Understand the relationship between the numbers in a multiplication/division fact family
- Understand the meanings and use of fractions, including fractions of a set
- Use all 4 computation methods to analyze graphs, frequency tables and line plots
- Solve real world problems involving addition, subtraction, multiplication, division, measurement
- Solve real-world problems related to money

### *Represent and Model Mathematics*

- Use place value models to read, write, and represent numbers to 10,000
- Represent numbers in different equivalent forms
- Use dollar sign and decimal point in dollar amounts
- Solve addition and subtraction problems with greater numbers using a bar model

- Represent multiplication and division in different ways including arrays, area models, number lines, grouping, and sharing

#### **Fourth Grade**

- Make sense of Problem Solving
- Build skills in multiplication, division, fraction concepts, decimals, geometry, data analysis, and measurement through problem solving
- Solve real-world problems involving addition, subtraction, multiplication, division, and measurement including time and money
- Use appropriate strategies to solve real-world problems
- Apply and explain problem solving processes

#### *Reasoning*

- Explore concepts more deeply and justify reasoning
- Apply thinking skills
- Solve challenging practice problems
- Investigate mathematical ideas using critical thinking skills
- Use estimation to check reasonableness (whole number addition, subtraction, multiplication, and division)
- Demonstrate that figures and their flips, slides, and turned images are congruent
- Demonstrate that some figures have rotational symmetry
- Use properties of squares and rectangles to solve problems about area and perimeter
- Analyze line plots with fractions of a unit
- Identify, describe and extend numeric and non-numeric patterns
- Explore the relationship between models for multiplication and division of whole numbers

#### *Communication*

- Use journaling to present mathematical thinking
- Discuss mathematical ideas
- Work together in small groups and pairs
- Use lesson vocabulary correctly

#### *Connections and Structure*

- Demonstrate that decimal notation is an extension of the base ten system
- Examine the relationships between fractions and decimals
- Make connections among multiplication, division, factors and multiples
- Convert among mixed numbers and improper fractions

- Describe number relationships in context
- Identify equivalent fractions and decimals
- Make connections among GCF, LCM and operations with fractions
- Solve real-world problems involving multiplication, division, fraction concepts, data analysis, and measurement

#### *Represent and Model Mathematics*

- Represent numbers to 100,000 in various contexts
- Write numbers to 100,000 in standard, expanded, and word forms
- Model decimals to tenths and hundredths
- Write addition and subtraction number sentences for real world problems with fractions and decimals
- Use models to show relationships between improper fractions and mixed numbers
- Define and use symbols in geometry to identify and relate geometric figures
- Use a variety of models to represent multi-step real world problems with whole numbers, fractions, and decimals
- Use geometry (protractor, set square, grid paper) tools to model problems
- Apply understanding of models for multiplication and division
- Use a rule to describe a sequence of numbers or objects
- Translate between mixed numbers and equivalent improper fractions
- Use a variety of models for multi-digit multiplication and division of whole numbers
- Use a variety of models for addition and subtraction of fractions and decimals
- Measure perimeter and area in customary and metric units
- Collect data and organize it in a table
- Create a line graph from a table of data
- Interpret a line plot to solve problems in addition and subtraction of fractions
- Solve real world problems for all four computation methods, fraction concepts, data analysis, and measurement

## MUSIC

### PHILOSOPHY:

"Performing, creating, and responding to music are the fundamental music processes in which humans engage. Students, particularly in grades Pre-K–4, learn by doing. Singing, playing instruments, moving to music, and creating music enable them to acquire musical skills and knowledge that can be developed in no other way."

~ *National Standards for Music Education*

The SCH Academy Lower School for Girls' music program is centered around Carl Orff's philosophy that making music is every child's birthright and that children learn best by creating their own music based on elemental models throughout the world. Through speech, singing, moving, dancing, playing instruments, and drama, each child brings her particular strengths to the music classroom, making the experience richer for all. Through collaborative music making, students grow as musicians and as people.

### GOALS:

- To enable every student to participate fully in music through singing, moving, dancing, playing instruments, speaking, and drama.
- To understand music as a way of knowing.
- To promote social and cultural understanding, joy, and confidence through music.
- To provide children with their own heritage of songs and musical experience, which binds them together as a community.
- To make students aware of the connections between music and all other disciplines.

### METHODS:

- Using the voice, the body, and musical instruments, students express themselves individually and in groups, acquiring a diverse repertoire of songs and musical skills.
- Using the process of imitation/exploration/creation, children make their own music based on models given to them. They share their creations with classmates and learn to critique them and to develop them further.
- Active learning of musical skills ranges from discerning, imitating, and creating rhythm and pitch patterns in the Kindergartens, to



improvisation and composition of vocal and instrumental music in 4th grade.

- Basic understanding of notation is acquired through student-led solo and ensemble work and through instruction on recorder, violin, cello, and orchestral woodwinds.
- Singing during music class, concerts, and assemblies evolves in complexity from calls and chants to unison, canonic, antiphonal, and part songs with many group performances.

### EXAMPLES OF MUSIC EXPERIENCES:

#### Pre-Kindergarten and Kindergarten:

- Three classes per cycle, music enrichment in the homerooms, and two major concerts a year.
- Songs, rhymes, listening games, movement, dance, percussion instruments.
- Taking turns, leading, following, offering ideas, making music alone and with others.



- Listening and playing experiences that develop awareness of form, texture, timbre, dynamics, rhythm, melody—in contrast, gradations, and categories of sound.
- Integration with topics from the classroom—Pre-Kindergarten: body awareness, community, turtles, the ocean, city life, jazz, what comes from eggs.
- Integration with topics from the classroom—

#### **Kindergarten:**

- Patterns, counting, literacy, houses, brave, smart girls, animals in winter, insects, Navajo.

#### **First and Second Grades:**

- First and second grade have three classes per cycle; both have major concerts in December and April with other grades and assemblies by themselves.
- Learning standard and non-standard rhythmic and melodic notation through tonic solfa, rhythmic syllables, graphics, timelines, and sound pictures.
- Exploring concepts of rhythm, form, meter, dynamics, texture, and timbre with voices, pitched and unpitched instruments, and movement.
- Performing metered movement and expanding dance vocabulary (locomotion, movement



- forms to fit compositional forms).
- Singing and melodic instrumental work encompassing the pentatonic scale and beyond.
- Children leading the ensemble and learning elemental vocal and instrumental accompaniment forms.
- Integration with grade-level topics: 1st grade butterfly plays (original stories, music, and drama); 1st grade NASA Space Apps Challenge representing stars through instrumental sound for study of night; performance of music of Kenya with voices and instruments; 2nd grade concert celebrating community; 2nd grade rattle dances with original rattles created in art class; writing songbooks based on original song verses; performing original poetry set to music.
- Integration with other disciplines, including language arts, science, mathematics, and CEL initiatives.

#### **Third and Fourth Grades:**

- Third grade: three classes per cycle and two major concerts per year; 4th grade: two general music classes, an instrumental ensemble, and choral work per cycle and two major concerts per year.
- Introduction to recorder (3rd grade).
- Introduction to strings through an intensive supplemental program (3rd grade).
- Orchestral ensemble (4th grade).
- More advanced and more independent small and large ensemble work; more complex repertoire and compositional forms; students conducting and performing original compositions.
- Extended use of musical vocabulary and synthesis of concepts.
- Refinement of performance skills and vocal techniques.
- Integration with topics from the classroom and other disciplines: American history, geography, Egypt, the United States of America; integration with other disciplines, including language arts, science, mathematics, drama, and CEL initiatives.

## OUTDOOR PROGRAM

### PHILOSOPHY:

The SCH Academy Outdoor Program is designed to give the students a chance to learn and grow outside the classroom, provide them with the opportunity to apply traditional classroom knowledge in new environments and settings, while teaching them basic outdoor skills they can carry with them for life. Throughout the school year, the students in grades 2 through 4 are taken on guided hikes and outdoor adventures. By getting the children outside to experience their surroundings firsthand, we hope that they can use these skills to build confidence and in-dependence in the natural world around them. Our outdoors is predominantly in the Wis-sa-hickon Valley, our backyard. When students have an opportunity to spend time outdoors, they come to appreciate the intrinsic value of the environment and begin to form a lasting relation-ship with it that will hopefully develop into an ethic of caring for and helping to preserve our natural spaces for the future. Students in Pre-Kindergarten through first grade also explore the school surroundings through walks in the woods and natural explorations and discoveries.

### GOALS:

- To expand the learning environment.
- To build stewardship: respect for the environ-ment.
- To build social-emotional learning: problem solving, critical-thinking skills, collaboration, and team-building skills.
- To facilitate self-confidence and self-awareness.
- To build survival skills: safety strategies, map-making, and orienteering.
- To experience varied ecosystems and observe many different species of migratory birds and other wildlife.
- To increase outdoor time.
- To support the work of environmental educa-tion classes.
- To build community: involving parents and families.





# PHYSICAL EDUCATION

## PHILOSOPHY:

The Physical Education program is aligned with SHAPE America's (Society of Health and Physical Educators) National Standards, goals and definition of physical literacy: "Physical literacy is the ability to move with competence and confidence in a wide variety of physical activities in multiple environments that benefit the healthy development of the whole person."

## GOALS:

- To learn to move and to move to learn: the development of neuromuscular coordination, fitness, and physical growth through a sequential program of physical activity.
- To apply movement concepts and principles to the learning and development of motor skills.
- To encourage a physically active lifestyle.
- To achieve and maintain a health-enhancing level of physical fitness.
- To develop responsible personal and social behavior (teamwork, sportsmanship, communication) in physical activity settings.
- To demonstrate understanding and respect for differences among people in physical activity settings.
- To understand that physical activity provides opportunities for enjoyment, challenge, self-expression, and social interaction.
- To integrate with other educational areas such as math, science, language, tech, and music.
- To learn about the structure of the heart and how to maintain a healthy heart.

## EXAMPLES OF PHYSICAL EDUCATION EXPERIENCES:

### Pre-Kindergarten and Kindergarten:

- Listening, following rules and directions, and remembering movements in sequence.
- Activities involving balance, walking, jogging, running, galloping, jumping, hopping, skipping, leaping, rolling, tumbling.
- Various activities that require throwing, catching, bouncing, kicking, and striking.
- Integrating music, counting, and the alphabet in movement activities.
- Identification of body parts and muscles.

- Working all together, independently, and with a partner.
- Heart Adventure Challenge Course.
- Fitness.

### First and Second Grades:

- Increased cooperation and competition with emphasis on fair play, teamwork, and sportsmanship.
- Continued development of strength, flexibility, agility, large and small muscle coordination, eye-hand coordination, and spatial awareness.
- Exposure to team-oriented games.
- Cooperative and team-building activities.
- Heart Adventure Challenge Course.
- Fitness.

### Third and Fourth Grades:

- Learning basic skills and rules of soccer, field hockey, squash, basketball, volleyball, lacrosse, and softball through activities and games.
- Dance, rhythm and choreography.
- Continued development of strength, flexibility, agility, large and small motor control, eye-hand coordination, and spatial awareness.
- Cooperative and team-building activities.
- Fitness activities including the effects of exercise on the heart and body, healthy eating, and nutrition.
- Continued development of the concept of competition, learning the values of fair play, and sportsmanship.





## SCIENCE

### PHILOSOPHY:

"Learning science is something students do, not something that is done to them. In learning science, students describe objects and events, ask questions, acquire knowledge, construct explanations of natural phenomena, test those explanations in many different ways, and communicate their ideas to others. ... Hands-on activities are not enough—students also must have 'minds-on' experiences."

~ *National Science Education Standards*

### GOALS:

- To foster students' sense as scientists as they participate in scientific discovery—first, by asking questions, defining problems, designing experiments based on hypotheses; next, by observing, recording, comparing, inferring, and predicting; and, finally, by analyzing results and reaching a generalization.
- To connect children's science understanding to everyday life experiences, whether the students are in the woods, on the playground, at home, or in the classroom.
- To develop critical-thinking and reasoning skills to apply to everyday life.
- To show children how all living organisms are an integral part of the Earth's ecosystem, and that decisions people make profoundly affect it.
- To show how change is always occurring and that much of it is predictable.
- To nurture joy in discovery and an appreciation and respect for the beauty, complexity, and interrelatedness of the world.
- To provide opportunities for students to be creative, innovative, and possess an entrepreneurial spirit.
- To gain understanding through research and science vocabulary.

### METHODS:

- Lower School science includes a major environmental education component, as students explore, observe and investigate both in their classrooms and in the Wissahickon ecosystem that surrounds SCH Academy.
- Scientific experiments are introduced with increasing rigor and increasing responsibility for both independent work and collaboration with partners and in groups.

- Links between science and language arts, mathematics, social studies, art, technology, and music are continually developed. In fact, children explore science not only with their science teachers but also in their homeroom, art, music and CEL classes. Conversely, science teachers help develop writing, mathematical, musical, and artistic skills.
- Exploration of physics concepts and application of engineering principles are integrated throughout Lower School Science. Students are given the opportunity to solve problems by designing, creating, testing and refining their ideas.
- The Next Generation Science Standards science and engineering practices of asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, using mathematics and computational thinking, constructing explanations (for science) and designing solutions (for engineering), engaging in argument from evidence, and obtaining, evaluating, and communicating information are utilized daily in all grades.



## EXAMPLES OF SCIENCE EXPERIENCES:

### Pre-Kindergarten and Kindergarten:

- Water: open-ended exploration of physical properties of water; topics include sinking and float-ing, evaporation, mixing and solutions, surface tension, dissolving, and states of matter.
- Insects: study adaptations, body structures, and functions of insects including ants, ladybugs, mealworms, and cockroaches.
- Seeds: collection and classifying of seeds; experiment with basic needs of plants and observing the life cycle of a plant in our garden.
- Habitats on Campus: observe and study the phenology of our gardens and forest habitats.
- Paleontology: study of female paleontologists and their work; understand how fossils formed long ago and make their own fossil collection; participate in a fossil dig on campus.
- Opossums: study habits and adaptations while integrating math and literacy concepts; model for independent study of native animals in winter.
- Eggs: explore and classify animals that lay eggs.
- Deserts: discover animals and plants that survive and thrive in the desert; explore adaptations of plants and animals.
- Structures: discussion of engineering and ways to build different structures using a variety of materials; comparison of human-made structures to nature's creations; building structures, including chairs, 3D shapes, walls, tunnels, and homes.
- Air: open-ended exploration to describe the physical properties of air; discoveries include

that air has weight, air moves objects, and air can be used for making flying paper creations.

- Senses: explore our five senses; discover how our work as scientists requires us to use our sens-es.
- Animal Classification: discover how scientists sort animals into groups; explore the differences between invertebrates and vertebrates; sort animals into mammals, birds, fish, reptiles, am-phibians, and insects.

### First and Second Grades:

- Bees: a study of honey bee behavior, metamorphosis, and observation in their natural habitat; discover the importance of bees as pollinators; using creativity and problem solving skills, students design a hand pollinator.
- Magnetism: open-ended experimentation with these forces.
- Wheels and Axles: experimentation and design of a magnet-powered vehicle made with recycled materials.
- Forensic Science: use observation, clues, and inferences to solve a mystery.
- Owl Ecology: dissect and owl pellet, learn about food webs, and participate in an evening "Owl Prowl" hike in the woods.
- Skeletal System: compare the human skeletal system to other vertebrates.
- Engineering Bridges: build two- and three-dimensional shapes using a variety of materials; study of main types of bridges and their engineering principles; independent bridge design that satisfies a number of design criteria.





- Designing Mixtures: a kitchen chemistry exploration of scientific processes used to create mix-tures.
- Moon: observe the moon for one month and discover how it changes; the moon's phases follow a pattern over time.
- Plants: discover the needs of a plant and identify its parts; observe one tree in the woods over the course of the year and record its changes throughout the seasons; design an experiment to test what a plant needs in order to grow.
- Sound: study how sound is made and how it travels through air and objects; design and build an instrument that can change pitch and volume.

### Third and Fourth Grades:

- Water and Stream Study: understand basic concepts relating to watersheds and the water cycle; study the stream behind SCH Academy; raise trout to study their life cycle and release into the Wissahickon Creek.
- Earth Science: study the three major categories of the rock cycle; identify the major types of rocks found in the Wissahickon; identify the layers of the Earth and how the Earth's surface changes over time.
- Birds: learn about animal adaptations; compare and contrast different bird species; use scientific inquiry to design an experiment to study local bird populations..
- Electricity: study electrical circuits, batteries, bulbs, and switches; design and build a prototype for a product that uses electricity; understand how electricity is produced.
- Force and Motion: compare and contrast purpose and function of simple machines through constructing and testing models; demonstrate Newton's Laws by creating a chain reaction machine.
- Robotics: construct and program a LEGO EV3 robot to move forward, backward, turn, and sense its surroundings.
- Cells and Microbiology: identify the characteristics of living things; study plant, animal, and fun-gi cells using a microscope; design and conduct an experiment using the scientific method.

## SOCIAL-EMOTIONAL LEARNING

### PHILOSOPHY: RESPONSIVE CLASSROOM

"The Responsive Classroom approach is a widely used, research-backed approach to elementary education that increases academic achievement, decreases problem behaviors, improves social skills, and leads to more high quality instruction. The Responsive Classroom approach is a way of teaching that emphasizes social, emotional, and academic growth in a strong and safe school community. The goal of Responsive Classroom approach is to enable optimal student learning. Developed by classroom teachers and continually refined to meet schools' needs, the Responsive Classroom approach is based on the premise that children learn best when they have both academic and social emotional skills."

In addition to using the Responsive Classroom program, our teachers, in partnership with our Lower School Psychologist, adapt our Social-Emotional Learning curriculum to respond to particular needs of children at different developmental stages.





## SOCIAL STUDIES

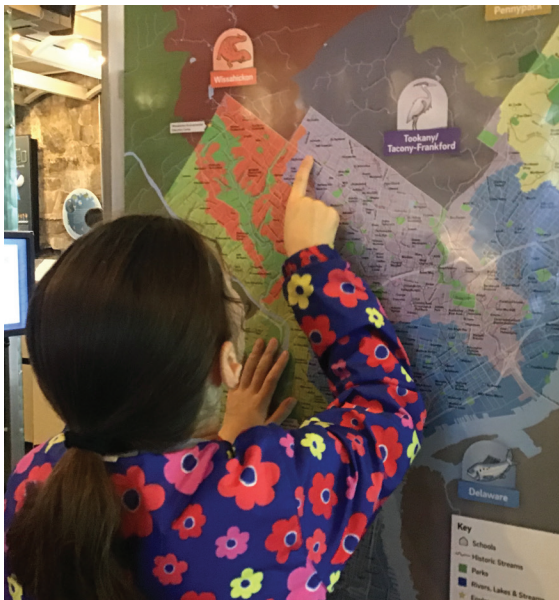
### PHILOSOPHY:

"The primary purpose of social studies is to help young people develop the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world. Social studies provides coordinated, systematic study drawing upon such disciplines as anthropology, archaeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology, as well as appropriate content from the humanities, mathematics, and natural sciences."

~ *National Council for the Social Studies*

### GOALS:

- To address children's basic questions of identity, location, creation, adventure, exploration, and transformation.
- To use history, geography, the arts, literature, and science to understand the variety of human experiences and to develop a sense of curiosity about other cultures, past and present.
- To develop research and reporting skills to find answers to questions and to develop an awareness of the range of available resources.
- To develop an understanding of oneself in relation to peers, family, community, and world; to foster a sense of responsibility through citizen-



ship and service; and to encourage an appreciation for diversity in individual personalities and group cultures.

### METHODS:

- Study of world cultures is interdisciplinary and encompasses art, music, language, mathematics, science, technology, and literature.
- Students are exposed to different languages (Chinese, Navajo, Swahili, Japanese, Mayan) in connection with the cultures they study.

### OVERARCHING STRANDS:

- Long Ago (Communities in the Past)
- Far Away (Communities Around the Globe)
- Over Our Heads and Beneath Our Feet (Communities in Nature and/or Communities of People Interacting with the Environment)
- My Place in the World (Social Justice and Community Issues)
- Trips, plays, folktales, music, art, and cooking bring each culture to life, enabling children to gain a deep and genuine understanding of the cultures they are studying.
- Community service projects reinforce an awareness of others and their circumstances. Projects such as Food on Friday for St. Vincent's Emergency Food Cupboard, Meals on Wheels, collecting books and toys for other children, fundraising for the Philadelphia Ronald McDonald House, Martin Luther King Jr. Morning of Service, and planting trees for the Wissahickon Stewardship Program demonstrate the value of being an active community member.
- Internet resources.

### Pre-Kindergarten and Kindergarten:

- Exploration of the natural world in relation to the questions, "What flies?" and "What lives in the water?"
- Exploration of the customs of another culture such as the Navajo.
- Study of insects.
- Study of eggs, starting with the question, "What comes from eggs?"
- Study of Navajo people, their customs, and dwellings.
- "Animals in Winter" study, including investigation of hibernation and migration, research, and oral reports.

- Exploration of our school neighborhood.
- Exploration of maps, beginning with the question, "Where do I live?"
- Service projects for clients such as Meals on Wheels.
- Service, food cupboard, special grade-level projects.
- Author study: Todd Parr, Ezra Jack Keats, Eric Carle.
- Brave, Smart Girls.
- Stone soup.

### First and Second Grades:

- Metamorphosis of butterflies; tracing their journeys.
- Study of Kenya and its geography, people, language, animals, customs, art, and literature; comparing and contrasting with our own.
- Trips in connection with the units of study.
- Study of night, including nocturnal animals, shadows, moon phases, dreams, occupations, and time.
- Study of Japan, its culture, language, art, traditions, customs, and literature, as well as the impact of geography.
- Study of what makes a community; an examination of the communities we belong to and their impact on our lives.
- Study of Colonial Philadelphia; making of a community.
- Creation of a three-dimensional community, with consideration given to architecture, city planning, and maps.
- Technology: computer used to support research, mapping, and curriculum-related activities.
- Service: in-house and greater community service curriculum.
- Recognition of special calendar days.

### Third and Fourth Grades:

- Study of Ancient Egypt.
- Cultures and traditions of our diverse SCH Academy community.
- Geography: vocabulary for and recognition, identification, and location of continents, oceans, countries, and landforms using maps and globes.
- Study of how the environment affects the way people live.

- Pennsylvania regions: geography, mapping, and researching attractions of each region.
- Philadelphia: early history, William Penn, establishment of "City of Neighborhoods."
- American Revolution: controversy and expansion in the new nation.
- The Gilded Age: immigration, industrialization, the growth of cities, the women's rights movement, transportation, and inventions.
- Independent research projects.
- Research skills: note taking, classifying and organizing information, presentation of findings, use of online and print materials.
- Community service projects.
- Conflict resolution.
- Related field trips.





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