

Make a Splash in the Classroom: A Hands-on Curriculum with Lessons and Activities on Swimming and Pools

Table of Contents

Overview

Grades K-4

Grades 5-8

Grades 9-12

Overview

The Red Cross recently found that [61 percent](#) of parents say their children (ages 4 – 17) can't perform [basic swimming skills](#). While the CDC reports that [one in five](#) people who drown each year are 14 years of age or younger.

To prevent these drowning deaths, the best course of action is to teach young people how to swim. However, there are other ways to educate young people about being safe around water.



Via Flickr – by [Katelyn Fay](#)

For example, incorporating swimming and pool-related lessons and activities into their everyday class work is an excellent way to keep students engaged while also providing real-world applications for what they're learning.

Following is a curriculum for educators and parents who are teaching K-12 students. It provides swimming and pool-related lessons and activities for teaching key subjects.

Grades K-4

As this *Washington Post* article explains, children start to become [“competent swimmers”](#) around 6 or 7. These years are also the perfect time to instill an understanding about water safety. What better way to reinforce what young children are learning about swimming and water safety outside the classroom than by connecting this fun skill to the subjects they're learning inside the classroom.

Physics

[The Physics of a Cannonball Splash](#) – From *Popular Mechanics*, this article teaches fluid dynamics using an example every kid knows and loves—a cannonball jump. It explains how their bodies displace the water and how they can make a bigger splash.

[Physics By the Pool](#) – This video provides an engaging, visual introduction to vortices. In it, a plate is used to create two vortices that cross the water, undisturbed. The instructor explains how and why this happens.

Science of the Summer Olympics – These videos use Olympic swimming to teach viewers about different concepts in physics.

- [Missy Franklin and Fluid Dynamics](#)
- [Designing a “Fast Pool”](#)

Chemistry

[Chlorine Facts for Kids](#) – [Science Kids](#) presents these facts about chlorine. Students will learn about chlorine's chemical properties, who discovered it, and much more.

Math

[Swimming and Math Skills](#) – This article provides suggestions on how to incorporate teaching math skills into a regular swimming lesson. It notes that swim lessons are a great time for kids to learn about ordinal numbers, shapes, whole numbers, measurement, and weight and resistance.

[Build a Pool for Beyonce and Jay-Z](#) – In this fun math problem, class members learn perimeter based on a requested design from Jay-Z and Beyonce.

[Mathematics in the Water](#) – Though it is designed to teach math to children with disabilities, this activity is a great way for any young person who's learning the basics of math to develop that skill while also strengthening their swimming ability. In it, an instructor uses wooden blocks with numbers on them to prompt students to solve expressions.

[Six Friends Swimming](#) – The class learns fractions using a number line. They're told how much of a race six swimmers have completed and they're asked to mark the distance on number lines for each swimmer. Then, they're asked additional questions to figure out how the swimmers progress during the race.



Via Flickr – by [Helgi Halldórsson](#)

Pool Length – This worksheet teaches about errors in measurement. In one example, students use finding a pool’s length as an example.

Swimming + Math Lessons – This activity is great for teachers or parents to do with kids who are just learning to swim. In the article, a mom explains how she designed this reading and math lesson for her son. In it, the pupil reads a book about swimming and then works on math skills by performing swim-related math problems. For example, how many strokes are in two laps?

Swimming Math – These short word problems help students learn how to add and subtract.

- [Butterfly Stroke](#)
- [Swim Practice](#)
- [How Many Meters?](#)

History

Pools in Ancient Times – The class gets an overview of the history of swim facilities from this article. It starts by telling about the “great bath” the earliest known “public water tank.” The article explains how it was built. It goes on to teach about how similar structures were used by ancient Greeks and Romans.

The History of Pools in the U.S. – This article takes students through each decade starting with the 1930s and explains how pool use in the U.S. has developed over time.

The White House Outdoor Pool – Class members are taught the history behind the White House’s outdoor pool. They’ll find out which president commissioned it and which first families enjoyed using it most.

Grades 5-8

As a middle school teacher notes in this article from Edutopia on the art of managing middle school students, while routine and structure are important so are [“spontaneity and obtuseness.”](#) And a piece from Scholastic.com with [tips on teaching middle schoolers](#), underscores the need for these pupils to talk as they learn. As the article notes, “talking is how middle school students process their world and make sense of it.” By taking them out of the classroom and into the water (even if it’s just with their imaginations), educators can engage by teaching subjects in an unexpected way and allowing students to work together to learn more about how swimming can be connected to common subjects.

Physics

[Swimming and Newton's Laws of Motion](#) – The class can get an introduction to Newton’s Laws of Motion and how they apply to swimming via this easy-to-understand information.

[The Physics of Pool Temperature](#) – Diagrams are provided to explain how pools lose and gain heat.

[Finding Apparent Depth](#) – This lesson uses a diagram and provides a formula to teach the concept of apparent depth. The class learns why the “bottom of the pool seems closer than it really is” when they look down into the water.

[A Swimming Pool Problem](#) – Get class members thinking with this water displacement-based word problem from the University of Wisconsin-Stout. In it, students are asked what happens to water level when bricks are moved from a row boat floating in the water and dropped into the pool.

[Refraction Phenomena](#) – In this lesson from Physics Lab, diagrams are used to teach different concepts related to refraction. Classmates will learn about apparent depth, mirage, and total internal reflection.

Chemistry

[How Pool Chemicals Work](#) – This article from HowStuffWorks.com serves as a great introduction to chemicals and the role they play in keeping swim facilities clean and sanitized.

[Understanding Chemistry](#) – Through this article from HealthyPools.org, students can learn more about the role chlorine plays in keeping pools clean. The site also provides information that clears up [popular myths](#) about chlorine.



Via Flickr – by [Scott Lewis](#)

[How to Test Pool Chemicals](#) – In this activity, pupils walk in the footsteps of “Christie,” a young woman who has been tasked by her father with adding and monitoring the necessary chemicals in their backyard pool. The guide leads students through the decisions Christie makes based on her knowledge of chemistry.

[How Do We Know What is Healthy Water?](#) – In this experiment, class members test samples taken from different water sources to see if the pH and chlorine levels are safe.

[Chlorine and Building Block Chemistry](#) – From the American Chemistry Council, this piece provides comprehensive but easy-to-understand information on chlorine and its uses. The article is broken down into six parts:

- [Introduction](#)
- [Chlorine, an Element That’s Everywhere](#)
- [Chlorine and Public Health](#)
- [From Whiter Whites to Leukemia Medications](#)
- [Introducing Building Block Chemistry](#)
- [More Building Block Chemistry](#)

Math

[Calculating Water Volume and Make-up Water](#) – This lesson leads students through how to find the volume of a pool and how to find how much water needs to be added to make up for loss.

[Pool Care Formulas](#) – With this comprehensive guide on water chemistry, classmates can test their math skills by playing around with the formulas and calculations provided on p. 28. They’ll learn how to calculate pool size, alkalinity, and calcium hardness.

[Fun with Tiles](#) – In this exercise, students learn how to use algebra to figure out how many tiles would be needed to create a border around the perimeter of the pool.

[Algebra 1: A Draining Pool](#) – In this lesson from the University of Texas at Austin, the class learns

polynomial expressions, how to solve algebraic expressions, and factoring while trying to find how long it will take the water to drain.

[Using Math to Build a Pool](#) – Students pretend they're building their own pool. By following this 13-question worksheet, they're asked to find the dimensions and how much it will cost.

History

[History of Chlorine as a Sanitizer](#) – In this brief report, class members learn who came up with the idea to use chlorine as a method of sanitization and how the method came to be used on a wide scale.

[Roman Baths](#) – Students find out about one of the earliest forms of a pool – the Roman Baths. They'll read about why and how the baths were used.



Via Flickr – by [Denise e David Butter](#)

[History of Roman Baths](#) – In this easy-to-understand piece, the class can read about why Roman baths were used, what materials were used to build them, and how they were designed.

[Swimming Timeline](#) – This article provides a timeline of the history of this popular activity and takes a look at how strokes have developed over time as well as how competitive swimming has developed.

9-12

By the time students are in high school, they've likely spent a good deal of time in and around pools. However, as this article from the *Houston Chronicle* notes, [only half of American teens](#) know how to swim. When teachers incorporate lessons on swimming and pools into their course study, teens receive lessons that are not only more engaging, but that also may encourage them to continue to work on strengthening their swimming outside the classroom, a vitally important skill to have in life.

Physics

Optics - How to Find the Image of an Object at the Bottom of a Pool – In this five-part video series, an instructor teaches the properties of refraction. He explains the formula classmates will need to use as they find images at the bottom of a pool.

- [Part 1](#)
- [Part 2](#)
- [Part 3](#)
- [Part 4](#)
- [Part 5](#)

Fluidics – Students learn about fluidics through lessons on Archimedes' Principle, Pascal's Principle, and Hydraulics. Fundamental definitions, equations, practice problems and engineering applications are supplied.

Find the Depth – This word problem asks class members to find the true depth based on the provided values. In the problem, an observer judges the depth based on a light ray leaving the pool, but because of refraction they do not have the true depth. Students are guided through the formulaic process for solving the problem.

Olympics Physics – In the 2012 London Olympics a new kind of starting block debuted. This article from *Wired.com* uses diagrams and formulas to explain how the new block design helps swimmers accelerate into the pool.

Fluid Mechanics and Statics – The CollegeBoard presents these AP exam prep questions. In one of the provided questions, the class is asked to assess what would happen if someone standing on the bottom of a pool dropped a bowling ball. They're asked to find how long it would take the ball to hit the bottom.

Reflection/Refraction/Diffraction & Lenses Test Questions – This physics test features two questions based on how and why refraction occurs in water.

Chemistry

PoolMath – Using this online calculator students can get a feel for the kind of chemistry and math issues they'd run into if they were maintaining a pool. Information on using the calculator can be found [here](#).

Disinfection – This lesson from Mountain Empire Community College gives an in depth look at how chlorine is used in the water treatment process. The lesson includes a two-part assignment, which includes a [crossword puzzle](#).



Via Flickr – by [Texas A&M University-Commerce Marketing Communications Photography](#)

Math

[Find the Volume of the Pool](#) – Presented by the University of Utah’s Department of Mathematics, this unit on geometry introduces pupils to several different concepts, including reasoning, proofs, parallels, and more. It includes several worksheets and activities, one of which asks students to find the volume of the diagramed pool and then answer accompanying questions.

[Trapezoids](#) – The class is given a real world example of a trapezoid—a pool. Then, they’re asked to answer several questions based on the provided values, such as finding the volume and how long it will take to fill it.

[Pool Math](#) – Students learn how to find the area and perimeter of different rectangles using pool as an example.

History

[Welcome to the WaterCube](#) – This article teaches about the theoretical research and physics principles used to build the WaterCube, which served as the swim center during the 2008 Beijing Olympics.

[Swimming Equipment and History](#) – Class members can find out more about the history of swimming in the Olympics by reading through this material. The article also includes access to a [reference document](#), which contains more information.

[Swimming & Diving Quizzes](#) – With these fun quizzes, class members perform research and then test their knowledge of swim history:

- [Who Did They Swim For? Part 1](#)
- [Who Did They Swim For? Part 2](#)

- [Olympic Competitive Swimming](#)
- [Swimming for Champions](#)
- [Name the Stroke](#)