| **SHAD IN THE CLASSROOM** |
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| **Activity Summaries** |
| **Activity** | **Description** | **Appropriate grade levels** | **Subject area** | **NC Curriculum****Correlations** |
| [American Shad Scents](https://drive.google.com/drive/folders/165OZ5pLQA-ZsAU1oo5mpevJx-VQsvLbi?usp=sharing) | Students will calculate river mileage available to American Shad, learn about survival adaptations, and perform an exercise using scents to find their way to a successful “spawn”. | all | ScienceSocial Studies | 2.L.1, 7.G.1.1, 6.G.2.2/7.G.2.1, 8.L.3.1 |
| [Aquatic Macroinvertebrate Sampling](https://drive.google.com/drive/folders/1XDuhfTugWAP-R26Rjj3R63I8EUMEUexw?usp=sharing) | Students will use nets to sample for aquatic macroinvertebrates in the stream (or pond). Collected organisms will be identified using a dichotomous key and then returned. | all | Science | Bio.2.1, 8.L.3, 8.E.1 |
| [Biologist Interviews](https://drive.google.com/drive/folders/1rRhJM58GOzIGezxJiTlQQUMLsMwSSMFA?usp=sharing) | 5-10 minute long interviews with a diverse group of North Carolina aquatic biologists, including student reflection questions to use during viewing. | 6 - 12 | Science |  |
| [Catch you later!](https://drive.google.com/drive/folders/18_yN18dt2qF8T2G6q6BW2X0ANj_Vhlb1?usp=drive_link) | Students will learn about various fish sampling gear and in what scenarios they are used. Students will estimate the size of an American Shad population (simulated) in the Neuse River using the mark-recapture technique. | 6-12 | Science, Math | Bio.2.1, NC.7.SP.3, NC.M3.S-IC.4 |
| [Fintastic Sort and Dichotomous Key Activity](https://drive.google.com/drive/folders/1kwNiIOyo_crwD_ZRKWj_t1SiIXAnQzu2?usp=sharing) | Students sort images of fish based on self-determined characteristics in small groups, then reflect as a class on how they chose to sort. After instruction on some anatomy terms, students use a dichotomous key to identify common river fish species. | all (Fintastic Sort)3 - 8 (Key) | Science | K.L.1, 5.L.2, Bio.3.5.2 |
| [Food Web Activity](https://drive.google.com/drive/folders/1kILyyQ6_a0EY3hLg0N2k9DaXT9sSaDn1?usp=sharing) | Students will understand complexity and connectivity within a near shore marine ecosystem by learning the story of the American Shad, creating a food web, and identifying specific reasons for their decline as well as restoration practices that can help bring them back into the ecosystem. | 3-8 | Science | 6.L.2, Bio.2.1, 4.L.1 |
| [Genetics Activity (Who’s Your Shaddy)](https://drive.google.com/drive/folders/1EegMNk7HbBHYgAeBfX_dXsnDrHFtaVBj?usp=sharing) | This is a genetics exercise to help students understand how researchers can determine in which river individual American Shad spawned and who their parents were.   In general, this exercise will help reinforce an understanding of heredity and heterozygocity vs. homozygocity. | 7-12 | Science | Bio.3.1, Bio.3.3 |
| [Gyotaku – Fish Printing](https://drive.google.com/file/d/1ki0q7hscrnVjpg76poMgkknDt_aqlrmi/view?usp=sharing) | Making American Shad (or other fish) prints allows students to blend learning external fish anatomy and art. | all | ArtScience | CX.1, CX.2, V.3 |
| How Old is [Your](https://drive.google.com/drive/folders/1AHLbJsQp8ip1eCWw7a61ZuE2d8NFh4by?usp=sharing) Shad | Students observe their American Shad embryos or larvae and record observations. Then, they use a chart containing images of developing shad to determine the approximate age of their embryo or larva. | 4-12 | Science | 2.L.1.1, 2.L.2, 4.L.1, 5.L.3, 8.L.3 |
| [Migration Madness](https://drive.google.com/drive/folders/1zzS27h6H1VcHLIobgz1M_M2xh8q-xgn1?usp=share_link) | Students will “travel” a length of the Cape Fear River while encountering obstacles to experience the migration of the American Shad into this river basin. | 4 - 12  | ScienceExpressive Arts |  |
| [Nonfiction Reading and Writing](https://drive.google.com/file/d/12b469PYAGP8VCa4lSzuZdT-Ct3XT0m0G/view?usp=sharing) | Students will read a nonfiction article or book. After reading, students will summarize and translate what they learn by creating a science journal entry or other written piece such as an article. | 4 - 12  | ReadingWritingScience | **Reading Standards:** 1 RL.4.1, RL.7.3, RL.9-10.5, W.3.2 - W.5.2 |
| [Shad Life Cycle Activity (aka Brad the Shad)](https://drive.google.com/drive/folders/15ehywA3ykNndqKM4qJU3i8lJEJ91QimV?usp=sharing) | Students match life cycle images and descriptions, then arrange themselves in a timeline to tell the story of the American Shad life cycle. An extension activity from Annah Riedel provides a Google Slides-based self-guided review of shad life history and anatomy. | 4 - 12  | ScienceSpeaking/Listening | 2.L.1, SL.3.4 - SL.5.4 |
| [Shad Origami](https://drive.google.com/drive/folders/1NNUOEBOAre9g-GiwECLWFOBXrzY68mdW?usp=sharing) | Create an American Shad origami (paper folding) | all | Art | CX.1 |
| [Shad Pipette Art](https://drive.google.com/drive/folders/1Rrn91QqvmFpleZNu8NobAx5GxX5BLSeo?usp=sharing) | This project will assist students in improving their skills using a plastic squeeze transfer pipette in a fun and artistic manner by practicing with paint. | all | Art Science | CX.2, V.3 |
| [Watershed & GIS Activity](https://drive.google.com/drive/folders/15OTxw7gPKMtuZI635EusBSBl_KHyuTl-?usp=sharing) | Using GIS generated maps; you will learn about blockages, or dams, along our rivers impeding anadromous fish, like American Shad, from moving up rivers and tributaries. You will become a fisheries biologist for a day and use real GIS data found on watershed maps to decide which dams should be removed to allow shad to migrate further upstream and back to their traditional spawning grounds. | 6 - 12 | MathScienceSocial Studies | 6.G.2.2, 7.G.2.2, NC7.RP.1 |
| [Wishes of Fishes](https://drive.google.com/drive/folders/1JHJ2W8N1cO2FZm4w7y09T-yQM2GhMInd?usp=sharing) | In this activity, students will use both artistic ability and research skills to learn about shad and prepare a graphic on American Shad. This interdisciplinary activity links science with reading, writing, and art. You can choose to do the Shad Silhouette Mural or the Shad Paper Fortune Teller or both! Share your creation(s) with your class or school. | 4-12 | ArtReadingWriting | RL.6.1/RL.7.1, RI.4.10/RI.5.10, W.3.5 - W.7.5, W.3.2 - W.5.2,8.L.3, CX.2, V.2 |